22, 1912.

terations at Driver's
Mr. A. E. Cogswell,

y & Co. £1,034 0 0
J. Privett ... 1,018 0 0
Tanner 1,004 0 0
Croad 945 0 0
Crockerell ... 927 0 0

erection of school and
n :—

lden & Cox £2,504 0
pley & Co.,
td. 2,500 0
nklin, Ltd 2,388 0
G. Butler 2,387 0
Cox & Sons,
bingdon,
erks * 2,307 0

to business premises,
s. T. A. White & Son.
Prudential-buildings,

ckerell £468
es 434

Stone.
Stone.
Stone.
Stone Co., Limited
Co. and C. Trask & Son.
e Co.).
am, Somerset.
E. A. Williams,
Strand.

and Metallic Lava
, Office, 42, Poultry,
materials for damp
rehouse floors, flat
l milk-rooms, gran-
es. Asphalte Con-
T.N. 2644 Central.

CO., Ltd.,
D PRINTERS.
s of Sale promptly
t, Soho, W.

N & CO.
838),
IARF,
DEPTFORD, S.E.
1102 (two lines).
Mark.
sphalte.
FELT ROOFING.
E SILICA PAVING.
t from the Mines).

ng
AR.
ng.
Telephone:
3032 (4 lines).
N.W.

VOL. CII.—No. 3808. MARCH 29, 1912.

THE BUILDER

CONTENTS.

	PAGE
A Lesson from America	349
King Edward Memorial	350
Notes	351
Art Exhibitions	352
The Architectural Association	352
The Carpenters' Hall Lectures	356
The International Smoke Abatement Exhibition	357
Testing of Materials used in Reinforced Concrete	359
Architectural Societies	361
General News	362
Correspondence	363
Intercommunication Column	363
Editorial Summary	364
Meetings	364
The Architectural Association: Fifth Spring Visit	364
Competition News	364
Notes to Illustrations	364
Fifty Years Ago	364
Contemporary Architects and their Work: Mr. Arnold Mitchell (with Illustrations)	365
The Building Trade:—	
The Right to Work	370
London Association of Master Stonemasons	370
The Institute of Builders	370
Incorporated Institute of British Decorators	370
Builders' Clerks' Benevolent Institution	371
Government Contracts	371
London Master Builders' Association	372
General Building News	372
Applications under London Building Acts, 1894 to 1909	372
Projected New Buildings in the Provinces	373
The London Opera House.—III. (with Illustrations)	374
Reinforced Concrete in Great Britain.—IV. (with Illustrations)	375
Books	377
The London County Council	377
Legal Column	377
Law Report	378
London Councils	378
Obituary	378
Foreign and Colonial	378
List of Competitions, Contracts, etc., Open	379
Patents	381
Some Recent Sales	381
Prices Current	382
Tenders	383

Illustrations.

The Work of Mr. Arnold Mitchell, F.R.I.B.A.:—
House in Surrey: Garden Front.
Barnett Hill: Entrance Front.
University College School, Hampstead.
Ascot Place: Fireplace.
Combination Room, Caius College.
House in Surrey: Entrance Hall.
Ascot Place: Organ Front.

The Vineyards, Great Baddow, Essex: The Entrance Front as altered (Mr. Arnold Mitchell's House). (*See page* 365.)
Mr. Arnold Mitchell, F.R.I.B.A., Architect.

A LESSON FROM AMERICA.

THE contemporary architecture of America is a manifestation of the modern spirit of progress in a newer and less restricted country to which we who live and work amidst more firmly-established traditions might more often direct our attention.

The recent discussion at the Architectural Association showing so much appreciation, and, we think, discriminating appreciation, of the great progress recently achieved on the American Continent is a hopeful sign that we are beginning to realise the necessity of bestirring ourselves.

As Mr. C. C. Brewer points out, a country progressing at the speed of America needs competent and vigorous architects, and forces them to the single purpose of erecting the best possible building in the shortest possible time, and that the architects are rising with almost incredible success not only to meet the practical and commercial needs of the community, but to work out artistic problems with a certainty, a dignity, and a breadth the equal of which it would be hard to find in any other period.

This is probably no exaggeration. Nothing is more interesting and instructive than the way the architects have organised themselves and their methods to cope with the situation. These methods might not suit this country; they may even appear to us to be quite inadequate for the production of those special qualities of design to which we attach so much importance, but there is no doubt they are exactly suited to the special circumstances of the case, and have resulted in what might justly be described as the architecture of efficiency.

Whatever limitations this architecture may have from our point of view, or by comparison with the great periods of the past, it would probably be safe to say that in no other country at the present day does architecture more readily respond to the demands of the moment.

The demands of a comparatively new and rapidly growing community are different, and in some respects may be less exacting than those of an older and more settled civilisation. In the rush of material progress something of value may have to be left behind, subtleties may possibly be overlooked, but the essentials necessary to that progress are demanded, and American architecture never fails to supply them.

It seems to us that so long as the architects of America continue to answer to these demands, to attack every new problem as it arises in the same fearless spirit of practical efficiency, and to keep pace with the progress of the country, there is no fear for the future or for the evolution of a characteristic style. When America finally arrives her architecture will arrive with her.

There are those who consider that a definite style is as much a matter of temperament, of mental standpoint, or of method as of features and details, and expect that the immediate future is more likely to produce a cosmopolitan style with slight national or racial variations, than such differences of form as we have seen in the past. Such may be inclined to think that the first indication of characteristics distinctly and typically American has already made its appearance.

There may be those also who will hold that the very limitations of the conditions under which American architecture has been compelled to develop have not been altogether detrimental to its progress. To the student of every form of art the time study is of inestimable value. Whether in drawing a figure or designing a building, the time limit teaches the necessity of going straight to the heart of the problem, of grasping and expressing its essentials to the exclusion of its non-essentials. A generation or two of practice in such studies, with a short time limit and so exacting an instructor as practical necessity, is no bad preparation for the more leisured maturity which the future seems to promise to American architecture.

Although the time limit is not altogether unknown here, particularly in relation to our commercial work, it would be impossible to say that English architects have so thoroughly learnt the lessons it is capable of teaching, or that the work produced under its influence is comparable in the broad handling of the essentials of a problem to that produced in America.

Making all allowances for the native genius of the American architects, there is no reasonable doubt that their success in rising to the occasion and in turning the disadvantages of their environment to the ultimate advantage of their art is due to their superior education and to the system of training based upon that of the École des Beaux-Arts. Unless we are to own ourselves inferior to the Americans in natural ability, it is only reasonable to suppose that our comparative failure in this respect is due to our lack of a similar training. The pressure of a time limit does no doubt demonstrate the necessity of being able to immediately grasp the essentials of a problem and present them lucidly and forcibly, but only a sound theoretical and technical training such as this will enable us to do it. It is here that we are so lamentably deficient and altogether behind the times.

Nowhere is this deficiency more apparent than in our competitions, yet nowhere is this special facility more in demand.

Here we have a system which, if rightly conducted, is admirably adapted to enable the young architect to obtain that continuous practice in the instantaneous grasp and broad presentation of essentials which is so necessary to ultimate success, yet from lack of proper training in a right method of procedure he is unable to take advantage of it. The result is that the average competition design is chiefly remarkable for the painstaking but useless elaboration of irrelevant and non-essential details.

In no class of work perhaps would the benefits of a Beaux-Arts system of training be more promptly and profitably realised.

It is not a question of "Orders" or of forms and features, it is a question of the whole mental outlook towards architecture, of the right attitude of mind or the right direction from which to approach a problem; a question of principles and of the continual practice of a right method of applying them to every known type of building.

It is here that the English architect is so hopelessly outclassed in international competitions. Pitted against opponents with specially-trained minds, and the general arrangements and main characteristics of every type of building at their finger-ends, English architects under the same time limit have no chance whatever to do justice to their undoubted good qualities.

But, although national vanity may find some consolation in the reflection that for all this we still lead in domestic architecture, it will soon be necessary to ask ourselves how long this consolation will be ours. Domestic sentiment and the love of home are characteristics of every branch of the Anglo-Saxon race. In that branch which is most highly trained will this sentiment find its most complete expression in the future.

KING EDWARD MEMORIAL.

WHEN the site in the Green Park now apparently finally adopted for the King Edward Memorial was first selected we ventured to point out that the Committee were by no means at the end of their troubles, as the site presented inherent difficulties and would create problems not easy to solve.

The report of the recent meeting of the Committee at the Mansion House and the publication of the sketch designs for the Memorial prove that our fears were only too well founded. The difficulty with the vista and with the unfortunate fact that a statue cannot face both ways at once have proved so far insuperable. In answer to Sir Squire Bancroft's objection to King Edward's back being turned on Piccadilly, Sir Vezey Strong could only endeavour to console him by suggesting that, though the monument did turn its back on Piccadilly, that back would be a very attractive one. Should anyone ever be so rude as to turn his back on our late Lord Mayor, we trust it will be an equally attractive one, and that Sir Vezey Strong will find in its attractiveness sufficient justification for the lack of courtesy.

We have already expressed our opinion that the right way to obtain the best design would have been by open competition, and our fear that "unless such a course is adopted it can only be a lucky fluke if the memorial escapes being counted as another of our too numerous failures in this direction." So far as we are able to judge from the sketch designs, our forebodings were not without a certain measure of justification.

But, although it must be admitted that this sketch design is far from successful, and that it hardly represents the best that contemporary talent could produce, it must not be forgotten that it is not the first choice of either the architect or the sculptor, and that no artist is at his best when he has been put off his stroke or has been persuaded to work on lines with which he may not be altogether in sympathy. We understand that a more comprehensive and distinctly architectural scheme was originally submitted, which unfortunately failed to meet with the approval of the Committee.

This, in the circumstances, appears to be particularly unfortunate. If the Committee were influenced in their decision to select artists in whom they had confidence by the hope that they would be able to leave the matter entirely in the hands of these artists, and so save themselves much trouble and anxiety, this hope appears to have been frustrated, and any advantage which the method of selection may be supposed to possess in this respect over that of open competition does not appear to have been realised.

We notice that Mr. Christopher Head suggests that, as the park at Shadwell is the only scheme upon which they were all agreed, they should spend 10,000*l*., instead of 20,000*l*., on a statue only in the West-end, and devote the rest of the money to Shadwell. This is one way of dealing with the problem that has something to commend it. If the site cannot be properly treated, the less that is done the better; and if only a statue is required, it might be more easy to find a suitable site.

In a city like London that has grown up haphazard, however, sites are made, not found. It is perhaps one of the reasons of the present difficulty that the Committee has all along been expecting to find one ready-made, and has not realised that if a satisfactory result is to be obtained a good deal of money must be spent in the formation and preparation of a site. But as Sir Vezey Strong has stated that this site is irrevocably fixed, it is useless to discuss the question further.

The only thing left now is to try and make the best of a bad job. If it is definitely determined to place a monument of this description so that it spoils the vista from Piccadilly to the Queen Victoria Memorial, and turns its back on Piccadilly, it might perhaps be well to

carry the idea to its logical conclusion by ignoring Piccadilly altogether. We believe the suggestion has already been made that the monument might close the vista from Buckingham Palace and be backed up by trees screening it entirely from Piccadilly, and we think the idea might be borne in mind.

We do not know whether the fact that the Committee has to divide its funds between the Green Park and Shadwell had any influence on the rejection of the artists' original and more expensive scheme. We long ago expressed our fears that with energies divided between two schemes justice would be done to neither, and we seem to see in the approved design just another example of that spirit of compromise which is supposed to have such happy results in public affairs, but which in art is generally so disastrous.

The result is a monument which is neither one thing nor the other. Neither the fine architectural lay-out proposed by the artist, nor the single statue suggested by Mr. Head; neither the great Sovereign of a mighty empire, nor the simple, kindly friend of the least among his people.

NOTES.

The Newest Responsibility of Architects.

We have heard a good deal lately about the newer responsibilities of the architect, but, however indefinite they may be, we hardly think they can include the architect's liability to be held up to scorn by picturesque writers in the daily Press for sins he has not committed. We quite sympathise with the feelings which evidently prompted Mr. Philip Gibbs to write so forcibly in the *Daily Chronicle* on the housing accommodation provided for the ironworkers of Dowlais. His indignation does him credit, but let him be just in his wrath. Dowlais, we fear, is not a pleasant place. "As I climbed up the steep road," says Mr. Gibbs, "I tramped up a crescendo of awful squalor, ending in hideous triumph. The devil could not have built Dowlais with more sublime effects of ugliness." After this we are not surprised to hear that "In Dowlais it is difficult to be decent, and some of the people have given up trying. For here, in narrow streets and alleys, straggling up the hillside, are rows of squalid hovels, of two, three, and four rooms, built eighty years ago, in many cases, and never repaired since then. The stones are loose in their walls. The window-frames have warped. Tiles have fallen from the roofs. Their gutters are twisted. Their front doors hang loosely on their hinges. They were built before sanitation was a word in the spelling-book of life. The architect did not worry about drains. Whoever he was, in his utter callousness to human needs he did not worry about anything better than a sty in which to herd the slaves of industry." Whoever he was, we feel sure he was not an architect in any sense of the word; but whoever he might have been, the callousness was his employer's, and he certainly is not responsible for the present state of these pigsties after eighty years of neglect. "Through the bell-mouths of those blast furnaces," says Mr. Gibbs in the final climax to a crescendo of awful indignation, "would I toss the men who built these human pigsties!" If justice demands that anyone be tossed into a blast furnace, we suggest the person who is making a profit out of their present condition, or those who are responsible for the fact given by Mr. Gibbs, though we are not responsible for his statements, that whereas whole rows of them have been condemned by the local authorities as unfit for human habitation, yet "most of those condemned houses are still inhabited, and the tenants take in lodgers." This should interest someone at the Local Government Board.

Old Buildings and Street Widening.

From various parts of the country come appeals from lovers of the fast dwindling old-world buildings against street-widening schemes which, devised chiefly in the interests of the motorists, threaten to abolish all that is characteristic in our country towns, and to reduce everything to the commonplace. Certain of the inhabitants of Lyme Regis are strenuously opposing a scheme for widening the foot of the main street, which will sweep away a well-known old-world building known as the Fossil Shop, situated on a still more ancient bridge, and which will destroy the character of this part of the very picturesque town. The majority of the Borough Council favour this scheme, no doubt only regarding the narrowness of the thoroughfare, but a considerable number of ratepayers are opposed to it, and probably outside public opinion might be invoked in their favour. Nowadays it is not sufficient to advocate the retention of the beautiful on æsthetic grounds alone; the practical side has also to be regarded; but in this instance there are also some practical reasons against the scheme. The piece of the road it is proposed to widen resembles the neck of an ordinary wine-bottle; the road is wider where the body of the bottle would be, and within a few yards there is a very dangerous right-angled corner. At present the narrowness of this short piece of the street compels motor traffic to slow down and approach the corner carefully but if this short neck of the bottle be widened motor-cars can approach the corner rapidly, and a thoroughfare which so far has been the scene of no serious street accident will be rendered more dangerous. Thus for once the æsthetic and the practical seem to combine. If town authorities would only realise in time that in modernising their towns in ways which have no direct bearing on sanitation or health they are destroying one of their most valuable assets we should hear less of acts of vandalism throughout the country.

Up-to-Date Bruges.

Lovers of the old-time charms of Bruges will be distressed to learn that electric trams on the trolley system are being arranged for, possibly on the track of the noisy steam one, or "light railway," between the station and the docks and canal—at least, as a beginning. Should it pay its way, no doubt "widenings" will take place to enable cars to run down the Rues Longue, Ste Cathérine, and Aux Laines, and along the Rue des Pierres, and across the Grand Place, and possibly along the charming old Dijver. One thing in its favour may be mentioned, and that is that many will be glad of a lift over the cobbles. Another less unwelcome item of Bruges news just to hand is that restorations are in progress at the Grunthuys, and a public garden being laid out round it, enabling a splendid view to be obtained of the apse of Notre Dame Church, old houses overlooking the canal, and so forth, which was impossible before. We know those "public gardens"!

The Building and Cost of Manchester Schools.

We gather from a letter by Mr. Geo. H. Willoughby in the local Press that the schools erected for the Manchester Education Committee are not designed by an architect, but are carried out by the Director of Education with the assistance of draughtsmen and a clerk of works, with the natural result that they are below the standard in design and construction, and cost more than similar buildings in the neighbourhood. We must confess that it sounds well-nigh incredible that in a great commercial centre like Manchester such unbusiness-like and inefficient ideas and methods should be tolerated. As Mr. Willoughby pertinently remarks, the University and the Municipal School of Technology both encourage the study of architecture. The Corporation makes itself to some extent responsible for the production and the training of the architect, and yet when produced and trained it denies him the opportunity to work in connexion with its own school buildings. The hardship to the profession is obvious; but Mr. Willoughby, rightly enough, we think, does not unduly press this point. While looking forward to the day when the advantages of a high standard of architectural excellence will be the strongest argument with the public, we have no doubt that in the meanwhile Mr. Willoughby is well advised to concentrate on the question of cost. This argument. at all events, should appeal to Manchester.

Forest Fire Prevention.

On previous occasions we have alluded to the appalling waste caused by forest fires in America, Australia, and New Zealand. Incalculable damage has been and is still being done by the thoughtless actions of settlers, campers, and others. In Montana and Northern Idaho alone the losses from fire in a single year have reached the total of 6,000 million feet board measure, with the estimated value of 4,000,000*l*. The Forest Service of the United States are doing their utmost to prevent devastating fires, and it is satisfactory to learn that considerable success has attended the inauguration of preventive measures. Among the modern aids now being employed for the purpose the telephone has been found most valuable, enabling observers on watch-towers to communicate almost instantly to other members of the service the position of any outbreak within a circle of some 30 miles radius, and so to ensure the prompt concentration of men and material for extinguishing the fire in its early stages. The work to which we allude is of direct interest to architects and builders, who

have good reason for desiring the conservation and intelligent management of the world's timber resources.

Ancient Villages in Lake Gatun.

IN autumn next the filling of Lake Gatun for the Panama Canal will submerge several early villages which, although not possessing the same interest as Egyptian ruins which suffered by the construction of the Assouan Dam, are, nevertheless, directly associated with the history of America since the discovery of the Continent. Some of the villages are mentioned in Esquemeling's account of his adventures under Morgan, and through them passed the main route to Peru in the time of the Spaniards. In later days they formed the home of gold diggers, and subsequently were occupied by those engaged on the canal works inaugurated by De Lesseps.

ART EXHIBITIONS.

OF recent art exhibitions there is none more interesting than the display of old glass panels at the Fine Art Society's Galleries. There are altogether 149 pieces of stained and painted glass, which are effectively shown in small groups of panels at a time, so that the light shines through the glass pretty much as it would *in situ* if it were not for a greater sharpness of contrast of dark background. The vast majority of the panels go back to early mediæval, mediæval, and Renaissance times, and the collection as a whole comprises examples of English, Flemish, Swiss, German, and Dutch craftsmanship. If the specimens are observed in chronological order the consideration is almost inevitably forced upon one that the earlier periods of the art were its finest; the quality of the glass possessed a deeper brilliancy, the tones were richer and blended into finer harmonies. It is curious to note that one of the most interesting specimens is one of the earliest—a grisaille taken from Salisbury, an almost perfect example of the art with a pattern evolving out of a geometrical design. We have later designs dealing with religious subjects, also of great interest. And then, as we proceed, the artists seem to strive after the expression of merely anecdotal ideas which have been expressed equally well, or better, in the arts of painting and carving of the same period. Examples such as these, apart from the virtuoso's and collector's point of view, and from the point of view of technical accomplishment, have not the same artistic importance as the earlier pieces. In view of the modern use of stained glass in domestic work the exhibition should not be missed.

At the same Society's galleries there are still a few of Mr. Walcot's pictures remaining on view, which make us regret that we did not see the whole of his recent exhibition. From those which are left—water-colour drawings of the Palais de Justice at Brussels, the old Ashmolean at Oxford, and a view of Messrs. Lanchester & Rickards' new building at Westminster, among other subjects—we were, however, able to discover a talent that apprehends the importance of the essential qualities of architecture and architectural detail in pictorial composition. We understand that Mr. Walcot also exhibited some reconstructions of classical work, which adds to our regret at not having seen the larger collection. Mr. A. Wallace Rimington, whose pictures now occupy the same gallery, is not indifferent to subjects connected with building; he is more definitely absorbed in the traditional view of the picturesque than Mr. Walcot, but this does not lead him to preclude subjects of definite architectural interest. In his more ambitious architectural studies, when he gets away from the quaint bits, we detect the influences of the school of Prout without, however, the precise knowledge which Prout possessed, for his time, of architectural proportion and form. Mr. Rimington's water-colours suggest something of the labour of the processes of the material in which he works; but if he is a little too conscientious in this respect, his sympathies are broad, and he obviously takes a sincere delight in various aspects of nature and portrays them with a certain lyrical appreciation.

So far as architecture is concerned, "The Pencil Society" (at Mr. Paterson's Gallery) has little to tell us. We do not quite know why it is called a society in any case. Millet and many other artists have shown us the possibilities of pencil-drawing. There is plenty of good work here, but it is not very serious. The drawing by Mr. Spurrier of St. Paul's Cathedral is free and correct; the compositions of Mr. Frank Gillett are interesting; Mr. Joseph Simpson is under the influence of certain phases which find expression in the Quartier Latin; Mr. Ross Burnett's attempts to discover an emotion in old cowsheds and old barns, not quite successfully; Mr. Cecil King catches the spirit of Paris in an English manner in two topographical drawings; Mr. Fergusson, in another type of subject, also suggests Paris in three drawings of considerable breadth and power. Mr. Hedley Fitton's "London Bridge" and "Site of the County Council Hall" are characteristic of his admirable work. The drawings of Mr. George Belcher, Mr. H. M. Brock, Sir Charles Holroyd, and others have all points of interest, but they are outside the purpose of the present commentary.

MR. GERALD C. HORSLEY presided on Monday at Tufton-street over a combined ordinary general meeting of the Architectural Association and of the Camera, Sketch, and Debate Club.

Mr. Hall, Hon. Secretary, announced that the sixth spring visit will take place on March 30, to the new Wesleyan Church House, Westminster. Members to meet at the building at 2 p.m. He further announced that the annual Smoking Concert and Revel of the A.A. Athletic Club will be held on March 26 at the Pillar Hall, Victoria Station Restaurant. Tickets, price 2s. 6d., may be obtained in the office or from Mr. C. G. Boutcher, 40, Great James-street, W.C.

Scrutineers were appointed in connexion with the election of officers for 1912-13.

The President proposed the following votes of thanks: The R.I.B.A. for the following—Annual grant of 100*l.* towards the educational work of the Association; grant of 25*l.* towards the publication in the Sketch Book of some of the R.I.B.A. prize drawings, and 21*l.* subscription to the Royal Architectural Museum; to Miss Lynam for her kindness in presenting a number of books from the library of the late Mr. T. M. Rickman; to Mr. W. A. Pite for his kindness in providing tea upon the occasion of the fifth spring visit, to King's College Hospital, on March 16, and for conducting the party over the building; and to Mr. G. A. Audsley for presenting three numbers of Allen's Technical and Art Manuals to the Association library.

Mr. C. A. Voysey then read the following paper on

PATRIOTISM IN ARCHITECTURE.

"If we make no effort to discover the foundations of our taste, we shall be easily borne away on the flood tide of fashion. And association appealing more to the heart than the head will override reason and leave sensuous emotion to carry us to the bottomless pit of Post-Impressionism. It is only a matter of degree how narrow or debased our taste may become if we lose the balance of the senses—that is, the proportionate use of reason and emotion, whether it be on the side of emotionalism or intellectuality, of spirituality or materialism.

The human pendulum is for ever slowly swinging from one extreme to another, and we are for ever struggling to arrive at a happy mean.

The present age shows a strong emotional tendency to swing towards the development of our imitative faculty, leading to conformity and collectivism, and away from the individual, creative, and idealistic manner.

In this collectivist attitude we see a vast amount of deadly conventionalism, which is a form of tyranny oppressing the young and old alike. It is too easily assumed that the majority are like sheep to be penned in and controlled, and that it is not safe to leave them free in any direction.

In matters of art conscience is no longer to be our guide, but some Cabinet Minister, with his satellites of self-satisfied advisers. In short, a Minister of Fine Arts is to be set up to impose the Order of the Parthenon.

A desperate endeavour is now being made to dominate men's conduct and to create what its advocates call a "national style," by imposing a definite Order of architecture on the young, and likewise upon the unfortunate competitor for public buildings.

Foreign Architecture and English Students.

Our educational system is based on the assumption that some foreign architecture is a fit study for an English student. And he is given every encouragement to travel in foreign lands, and by such means to gain fluency in the language of architectural forms without the laborious study of the national character and conditions that have given them birth. These are the gentlemen that write books to prove from whence certain characteristic forms are derived, absorbing attention in superficial likeness and missing the deeper points of difference, which, when examined in conjunction with climate and character, will be found to constitute the only vital and enduring qualities worthy of our study. It cannot be denied that it is far more important to know from what general principles good work is produced than to have a knowledge only fitted to reproduce given examples.

How certain forms and methods have been introduced by the importation of foreign workmen is important enough, but what should concern us much more, is how far any importations are fitting and desirable, sincere and true.

Now we must observe that in all the finest examples of architecture throughout the world we find that the qualities we admire are due to the faithful use of local materials and conditions, the sincere expression of national character and aspirations; both of which qualities are strongly influenced by climatic and also geological and geographical local character.

The climate of a country affects the light, and the light affects our enjoyment of textures and colours quite as much as of light and shade. Who has not felt the unsuitability of highly-polished marbles, mosaic, and highly-glazed surfaces in England, and their absolute fitness under Eastern skies? Do we not readily associate bright surfaces and colours with strong sunshine, and rich sombre colouring with our cloudy skies?

The effect of climate on the character of a people has been proved by many scientific writers, and needs no repeating here. It is enough to observe the characteristics of local material as evidenced in our own country. Even different counties and districts will show a marked difference in character. Compare,

for instance, the colour and texture of the materials in Westmorland with those in Kent. Let us mark well this characteristic of the finest architecture—viz., that it grew mainly out of national conditions and national character, and was never a foreign importation. And a national style can grow up in no other way. We must recognise our conditions, material and intellectual, if we would obey the Divine law of fitness.

Are we working now on this principle? Are we not setting up a model drawn from foreign lands, and endeavouring to squeeze our requirements into it? Only recently in public an architect was holding up to the admiration of his audience photographs of American railway-stations designed (as he said) as closely as possible on the model of ancient Roman Baths. Should we, therefore, design Roman Baths on the model of American railway-stations? What wonder if ignorant people buy old barns and convert them into houses, forgetting that if they are good barns they must be bad houses, and if good houses very bad barns! As if good architecture were not the direct product of the purpose of the building. The general custom is to set the heart on a symmetrical façade and then squeeze our plan into it, making dark passages and lobbies, rather than upset our symmetry. Do we not often use draughty, rattling wood sashes instead of stone windows and iron casements, in order to produce a Renaissance character in our building? Do we not give the same size window to a closet that we give to our banqueting hall if it happens to come on our main front? How often do we see puny little villas aping the manners of a ducal palace, porticoes and empty niches, cornices and broken pediments provided for the villa rented at 70*l.* or 80*l.* per annum! Showing clearly that the outside comes first in our calculations and the plan afterwards, and that we are wedded to a form that is not born of the parent of practical requirements, but the foster-child of a foreign-bred fancy. The structure is designed from without inwards, not, as it should be, from within outwards. I will not plead for either Gothic or Classic, but only that conditions and requirements shall dominate inside and out, and, above all, that the expression of thought and feeling shall be national and sincere. We do not want Chinese national character expressed in Piccadilly any more than Grecian or Italian character. We do not want the poor man's villa to ape the stately home of the wealthy.

The more we go to Rome the less we shall know of London. The freshness and charm of foreign lands has belittled our reverence for our own country. And we are apt to forget that our Maker has given us a climate and country different from all other nations. We cannot ignore this fact without loss of patriotism and national dignity.

English Thought and Feeling.

Fitness is a Divine law, and the more we investigate Nature the more we become impressed by its fitness: therefore we do wisely to work on the same lines and strive diligently after fitness. Can it, then, be fit to use foreign styles to express English thought and feeling? The English architect down to the end of the Tudor period was content to learn and understand all the conditions of his own country, to understand the character of his own countrymen and to express their emotions and aspirations. He was keen to learn the possibilities and limitations of his material, and, in order that we may benefit by his experiences in this direction, we should study all the pure English examples we come across, never forgetting that it is only unalterable technical qualities which we most need to learn, and not those accidents of passing fashion, or the changing manners and customs of different periods. It is very important that we should notice, for instance, the way the stone in different districts was used, rather than the existence of battlements or moats, which tell not of the history of building so much as of the manner of life of the people.

In our admiration for ancient examples we are apt to imitate the forms of obsolete features and miss the practical and essential truths concerning the fitting use of material. We are fascinated by the marbles and mosaics of foreign countries, and fail to perceive how they expressed the quality of mind of the nation; the quality of light in their native land, no less than the geographical and geological conditions out of which they have grown. This disregard of national character and national needs and conditions is the foundation of nearly all our unpatriotic conduct and sentiment.

How few of the rising generation know to what extent the old Gothic builders in England revelled in colour and rejoiced in rich displays of harmony and human emotion! Those were the men who had never travelled abroad—never journeyed to foreign lands with any adulterous intention or made love to foreign examples of their craft, but created noble buildings out of the bounty of their own land and the brotherhood of their own national character, and their own history, hopes, and aspirations, exactly as the Greeks and Romans, Italians, Japanese, Chinese, and all the nations that ever produced a national art have done.

But, alas, the later Englishman has been unfaithful; he has turned his back on his own climate, and hardly speaks of it except to abuse it! And he has opened his arms to all the foreign material he can lay his hands on. And he raves about the most un-English architecture he has got, regarding it as so magnificent that all practical considerations must be waived for the purpose of providing an æsthetic approach to it.

Men are quicker to discern likeness than difference, and any trivial likeness between one object and another in our memory is carefully treasured, especially if that memory gives us pleasure. We are content with trivial pleasurable sensations without troubling to look for more sterling qualities of fitness.

The fact that our St. Paul's is well proportioned and gives us a pleasing sense of light and shade, and is big, justifies its existence in many people's eyes. But that it is a clever man's copy of a foreigner's expression of his own national character—albeit a foreigner's wise and clever use of his own conditions and requirements—never seems to be considered as in any way a proof that St. Paul's is an exotic and not a national growth. It is not the product of our climate or the outcome of our national life. It is a theatrical falsehood of the most prolific period of profligacy. The few wealthy who could afford to travel were intoxicated by what they saw, and they quickly lost their hearts to foreign beauties. And the universal law that we strive to reproduce what we love and admire led them to tear down their English houses and erect Italian, Renaissance, French, and other foreign examples in imitation of what they had seen and in boastful proclamation of their foreign experiences. We are only now gradually awakening to the consciousness that the ravishing beauties of foreign architecture are always due to their being true and noble expressions of national character, governed by reverent regard for local conditions and materials.

Nature's Material Qualities.

As a general principle we may reasonably assert that Nature's material qualities are more beautiful than anything that man can produce, though man may add to and enrich the beauty of Nature by the addition of his own beautiful thought and feeling. The recognition of this will vastly strengthen our patriotic feeling, and, while encouraging a true appreciation of our own country, it will likewise help us to appreciate other countries more rationally.

It is of very great importanee that we should get at the truth of this matter, because our present method of education and the practice of our profession is steadily leading to an artificial mode of expression independent of the practical necessities of life. Our town halls, banks, public and private houses are all stereotyped bastard children of foreign parentage. And there is an effort being made to coerce the shopkeepers into the same mould. No matter what their trade may be, they must manage their business as best they may behind the Renaissance shirt-front. As if true architecture were the expression of a cultured traveller, rather than a stay-at-home craftsman's endeavour to use local material fitly, to minister to individual needs and requirements.

Town Planning.

The town-planner is a collectivist; his idea is to drill humanity into line and regulate his outward movements regardless of his inward needs. He, too, regards the general aspect and ignores individual necessities. He must have building lines and symmetry, regardless of individual tastes and requirements. He would have our tastes and requirements regulated by Act of Parliament—the deadliest machine ever invented when used to coerce taste. Acts of Parliament we need to protect the weak against the strong—to guard an Englishman's true expression of his love for his own country, not to force him to adopt the language and manners of a foreigner.

The vista may be a fine model to emulate and a suitable place for strutting human peacocks and peahens, but for a strenuous practical Northern people it is not a fit and true expression of their needs to be introduced into every speculative suburb. The revival of any style or period of architecture, whether English or foreign in origin, is an evil which tends to retard the due consideration of fitness in all its aspects.

Planning a House.

If we start a plan for a house with any preconceived example of a Classic temple or a Georgian mansion, a Roman bath, or even a Gothic monastery, we shall be the less influenced by the peculiar characteristics of the site, the building owner, or the purpose of our building. And it is from the consideration of these conditions alone that all the finest architecture throughout the world has ever sprung. Moreover, consider how immensely stimulating it is to all human powers to have to evolve your building from such sources. The delight, too, of searching for moral qualities worthy to be stimulated by our building is untold, necessitating also an interest in contemporary life and feeling, so keeping our work alive and growing, and avoiding the stagnation of stereotyped conventions of ancient times. But the present method is to accept first a Renaissance conception and then ingeniously squeeze your accommodation into and behind the shell, and classify your requirements to suit your thirst for symmetry. It is like a Chinese puzzle, a *tour de force*, a clever exercise in cunning, leading to all manner of subterfuges, and as such demoralising to all concerned.

English Domestic Work.

It is generally admitted that our English domestic architecture of recent years has advanced much more than the architecture of our public buildings and monuments. And I fearlessly assert it is because much of our domestic work has been produced by the method herein advocated, whereas our public buildings are invariably produced on the method condemned. And why? Mainly because the authorities who have to vote the money to pay for them are trying to please their electors, and they know that if they put up a hall-marked building—that is, something colourably like St. Paul's—no one will venture to criticise their choice or their taste. The word has gone round that St. Paul's is all right, and it has been repeated so often that Mr. Brown and Mr. Robinson find it a very convenient sample of good taste by which to gauge their public buildings; the architecture, according to the Alderman, being the outside jacket, and the added inside embellishments the gilt on the gingerbread, in fact, not one of them ever dreaming of the question—Is St. Paul's English? Is it a patriotic expression of our national character?

Public Buildings and Dirt.

If the importance of a careful study of national character and conditions were fully realised a student would have little time for travelling abroad; and if by the time he reached the age of forty-five he had made good use of his own country, foreign travel could do him no harm. But forty-five years is not enough time in which to learn everything about the resources and history of our own country. The more intelligent a man is the more he will feel how much more there is to learn than he can ever accomplish. If our modern public buildings are the outcome of foreign travel, who can defend it? Surely they are the deadest, uninspiring piles of wasted labour and material that any country can

O

show. Successful as dirt-traps and dust-catchers, emphasising the grimy nature of our town atmosphere. Here, then, we surely find in the rustications of our wall surfaces clear proof that the desire to adapt foreign detail has outweighed all considerations of fitness to our dirty town atmosphere. Innumerable are the examples of similar conformity to foreign styles, preventing due consideration of practical fitness; durability and cleanliness are sacrificed to imitative convention. The true mathematical proportion and placing of the Orders is regarded as far more important than the adequate lighting or convenient placing of our chambers. We ought no more to teach the five Orders to students than to train them in Chinese. Many will say that without the five Orders no sense of proportion can be taught. I do not think that with any Orders you can teach proportion. Proportion is a matter of feeling dependent on general culture and temperament. You may notice that every man's sense of proportion varies as much as the proportions of his body and limbs; and when he is sincere in the expression of his sense of proportion it is a reflection of his own bodily frame.

We can very well teach the character of materials and their proper use and limitations, but the less we try to teach art the better. Teach ethics instead, and make men think, and art will take care of itself.

It would surprise many of us if we were to consider the amazing effect on modern architecture the one study of cleanliness would produce. If we are to avoid dirt-traps inside and out we must concentrate our ornament and produce breadth and simplicity, both of which qualities demand good material and good workmanship. So by omitting conventional Renaissance detail we should be driven to devote much thought and feeling to the enrichments we have, and in the plain broad surfaces we should feel the necessity of well-chosen, genuine material and a high quality of workmanship.

Tyranny of Styles.

We can never arrive at these qualities if we are working to a definite style of the past. Use the past to supplement your experience of the use of materials, their possibilities and limitations, but do not be a slave to it. Do not depress young students by telling them they cannot possibly excel the noble men of old. Our increased experience ought to make us more able to excel anything that has gone before. The cultivation of patriotic feeling should make us devote more attention to English material, English conditions, and English character, and free us from the stigma of being called the most inartistic nation on the face of the globe.

Art, being the manifestation of human thought and feeling, must always be individual and national. Furthermore, the emancipation from the tyranny of styles would open the door to brother-craftsmen. We should feel the necessity for the work of the painter and sculptor in our buildings if we omitted the acres of machine-made Renaissance ornament. And brotherhood between the arts is what we need to stimulate, and it must necessarily follow the growth of patriotism in architecture.

The strongest argument in favour of creating buildings from requirements and conditions, rather than in obedience to any preconceived style or mode of expression, is that it opens the way for the appeal to our higher nature and stirs up the emotions and moral sentiments. It forces us to consider moral principles and work on definite lines of truthfulness, fitness, and fidelity. We at once see the necessity for investigating and making full use of local materials, or the economic conditions that justify imported goods. We are stirred to investigate all new inventions and fresh methods. This state of mind is one of perpetual alertness—on the look-out to seize every new advantage of modern times—and this healthy living condition is the most fitting wherein to recognise the true enduring qualities of life, viz., the moral sentiments. In our admiration for ancient buildings we forget that it is their manifestation of the spirit wherein they are great. The material we see is perishable and illusory. But in the spiritual significance and expression of moral sentiments they are indestructible. In our familiarity with materials we forget that it is always the spiritual essence that is the life and soul of our work. Not the form of our expression so much as the deep thought and feeling it betrays.

Can we not emulate Shakespeare in our architecture, and by patriotic feeling express and encourage what is best in our national character?"

Mr. Arthur Keen also contributed a paper, and said:—

"Let me say first how much Mr. Voysey's presence here this evening is appreciated by us. He has not hesitated before now to tell us frankly that he did not approve of our methods of education, but by coming to speak to us to-night he shows that he is moved by no narrow or dogmatic spirit, but is anxious to help us in our study of the art for which we share his affection. The position he takes up is a strong one, for, although he perhaps will not admit it, his appeal is to our feelings rather than to our judgment; and he speaks with the seriousness of conviction because it is well known that to the extent of his opportunity he has carried into effect in his own practice the views that he holds of the possibilities and limitations of architectural art in the present day. But that he is right in his main contentions I cannot agree. If he had put them forward thirty years ago they would have been received with enthusiasm, for the spirit of the mediæval past had a strong hold on the architectural imagination at that time; but the Gothic Revival has passed. And what has it taught us? It has taught us that it had to fail because we are no longer Gothic; that the Gothic tradition ended long ago, and cannot be conjured back to infuse our work with the vitality and personal quality that belongs to the old because our character and disposition have changed, our social conditions have altered, and our attitude towards all things has become one of doubt and inquiry in the place of submission and faith. Why should we live in a fool's paradise and imagine that things are other than they are? It never has been any use, and it never will be. We are eager and self-seeking we have acquired education, we have travelled and seen the world; we have facilities for the interchange of ideas and commodities; our methods of life and industry, our political views, our very religion has altered—we are the products of an eager, ambitious civilisation, dominated by science, by competition, by individual liberty, and by aspirations, hopes, and ideals different from, and opposite to, those of the past.

In many directions, however, there seems already to be a more general concensus of feeling, a broader basis of authority, a more definite conviction as to wide principles; and is not this coming about in the matter of art as in other things? Are we not already weary of each man doing that which is right in his own eyes, and is not the cry for a Ministry of Fine Arts the outcome of a desire for peace and good order, sobriety and restraint?

Convention.

Convention, social restraint—call it what you will—is it possible, human nature being as it is, to get away from it for long? Man is a social animal, and is, and always has been, ruled by convention, by the general acceptation of right and proper usages. It is an inborn sense, and collectively he cannot get away from it. However much an individual here and there may kick against the pricks, our architecture must be conventional if it is to represent us truly; and it should be of such an order that it can yield good results to a formal, academic method of expression that is able to associate itself with science and orderly civilisation, and with the commercial and social conditions that now obtain. An architecture that depended on the detached and original attitude of each individual would be intolerable. Wise restraint is almost always to be preferred to uncontrolled individualism. In the best days of architectural art and of the development of that art convention was universal—buildings, whether temples or churches, as much as ships and fortifications, were made on orthodox lines. Growth along those lines, not departure from them, was the constant characteristic. Indeed it is difficult to reconcile the design of a Greek temple with what one knows of the artistic aspirations of the Greeks, except on the principle of overmastering convention. A somewhat rude, ungainly type of building, impressive and dignified in its simplicity, but lacking the resource and imagination that we associate with Greek sculpture and decorative design.

There certainly seems now to be a desire to impose a definite and generally recognised method of architectural treatment, because the struggle has gone on long enough, and we feel that in unity of effort lies our only hope of achieving in any worthy way a form of expression that can be considered national; so that by these forms and these methods shall those who follow us know that this was the work of the British nation in the XXth century.

Revivals.

What is the logical outcome of the objection to sending the young man out to see the world? This, as well as the suggestion that he should work only in the material of his district, is an echo of the time when no facilities for travel or traffic existed. It would make the student into a kind of ancestral beaver, secure in his lodge, protected by his dam, snug and self-satisfied, without incentive or imagination or horizon. Are we not to take the world as it is, and are we to try and force our part of it back into a position it has left long since? I agree with Mr. Voysey that the revivals that he deprecates are lamentable enough, although in a measure they express faithfully the national attitude towards things; but I submit that the course we have had our attention directed to by him involves a greater revival than any we have had before—a revival of former social conditions rather than one of mere architectural forms, and I think that to be successful it involves the architect in becoming a mason, or a sculptor, or a carpenter again; for, if I understand aright the qualities that Mr. Voysey desires, they are to be obtained in no other way. We have had cases enough, and to weariness, of endeavours after texture and local character, and the appearance of "craftsman" art, obtained by laborious detailing and by close supervision of the workman, and I say, without hesitation, that such efforts are wrong artistically.

We have to produce our architecture at the drawing-board and by means of specifications and letters and bills of quantities; for Heaven's sake let us be honest and admit it, and not try to pretend that we are treading in the steps of our ancient brethren when we are beset about with contracts and by-laws, with County Council applications, with party walls, and with all the appliances and products of science and commerce. I was shown recently on a lantern screen two pieces of brickwork—one a genuine piece of XVth-century work with all the charm of irregularity and texture upon it and in it; the other was confidently put forward by the lecturer as the best bit of modern brickwork he had ever seen; it aped the characteristics of the old work in its irregularity, but to me it was a slovenly, untidy, rough bit of work that would have been a disgrace to the bricklayer if one had not known that the poor man, no longer free to work in the accepted way, had been made to do it, by the architect, as a deliberate piece of affectation. We are not mediæval bricklayers or masons; why should we pretend that we are? I do not think that Mr. Voysey wishes us to do so, but I do submit that what he suggests to us really involves us in something of this kind, for he claims that architectural character is to grow again out of the nature of the material, and its right uses in order to meet the needs of the time and express the ideals of the individual: as I understand it, this is the mediæval attitude, and involves the mediæval method.

We are to make our work national again, but when was it ever national in the sense of excluding foreign influence? It has been in a constant state of change since the beginning of our civilisation, and I think it would not be difficult to show that most of the change has been due to foreign sources.

The Saxons came from over the sea; our Norman architecture was an importation: Westminster Abbey itself is on a French model. Mr. Lethaby has been making startling suggestions lately as to architectural beginnings, and the transfer of features and of methods of construction from one part of the world to another. And why should not this transference take place? Does the delightful little bridge at Prior Park fit less well into the English landscape because it is in a sense an exotic? Are not the bridges at Cambridge or Bath homely and natural, although they may be based on foreign models? Is not Stamford a characteristic English town, although it is full of Palladian work? In every age and place the art of the native craftsman has been tinged and

suffused with the foreign influence. Here in England it has proceeded side by side with that of the professional architect for many generations, "stealing and giving" charm.

National Character and Style.

The "sincere expression of national character and aspirations"—what is it? What does it mean in these days? I am reminded of a cartoon that appeared in *Punch* some years ago showing a servant coming to Lord Beaconsfield with the announcement of a deputation below desiring information as to the Conservative programme. "Tell them," was the reply, "that we propose to rely on the sublime instincts of an ancient people." It was a well-sounding phrase, but had it any real meaning? And what does the sincere expression of national character mean? And what does "Patriotism in Architecture" really mean in these days? Does it really mean anything except that we are to use everything that comes to us in a reasonable way to suit our own particular needs?

We need be under no misapprehension that a style of architecture that does not faithfully serve the national need will endure. Mr. Voysey is severe on our town halls and banks and railway-stations, but to the extent that their architecture does not meet its requirements it already stands condemned. Is he not unduly severe with these buildings? He seems to deprecate symmetry in design, but surely a town hall is essentially a building that calls for such design; its plan must be simple and regular; the requirements of it suggest and impose uniformity and repetition. The axial treatment is the right one. And is not symmetry in the design of domestic buildings a great factor of beauty? Are such houses as Montacute and the great Jacobean mansions or the house in West-street, Chichester, the worse for it? I submit that house planning was never more sound and serviceable than to-day; but when have we had more striving after regularity and balance than at the present time?

Recognition of Materials and Conditions.

Mr. Voysey says that a national style can only grow up by a recognition of our conditions, material and intellectual; that we must obey the Divine law of fitness. Nothing can be more true or better expressed; but this does not cut us off from foreign influence; on the contrary, it leads us to it, for we are Cosmopolitan in these days—not hide-bound, prejudiced islanders. No doubt an architect may be wrong if he makes his railway-station resemble the Roman bath he has seen in his travels; but this is no argument against travel. He would be equally reprehensible if he made it resemble Durham Cathedral; but, on the other hand, a fine sound conception like the front of King's Cross Station may be the direct outcome of something seen in Spain or Constantinople.

I think it is a fair claim that most architectural students are, as a matter of fact, being taught to recognise all material and intellectual conditions, and to observe particularly the supreme law of fitness. But it is on this point that the issue really depends, for the schools advocate the use of certain well-known architectural forms and features in design that is to comply with these principles, and Mr. Voysey claims that these forms and features are not admissible; that they have no connexion with reasonable design, and that in fact they are used for their own sake. I think he is right here to a very great extent, and that features are commonly used in a wrong and gratuitous way; but surely features of some sort are admissible, and why should not suitable ones be adopted from old work, either native or foreign.

I fully agree that we must master, as far as we can, as Mr. Voysey says, the unalterable technical qualities, the uses and character of materials, and the essential truths relating to their handling; but, as we have been told before now, this leads us only to "pleasant building"; it is but a small part of architecture. Indeed, is it architecture at all? Is not architecture something added to building, something expressed through building, but in no way essential to it?

Education, etc.

We have been told that our present methods of education are steadily leading to an artificial mode of expression, independent of the practical necessities of life. Now, I doubt this very much. I believe our education is endeavouring to keep step with other education, and to equip the student to meet what must be regarded as the practical necessities of modern life. I do not want to be misunderstood or to put myself in a false position. I admire and love the old things; I would rather go out of my way than let an old bridge or a Whitgift Hospital be pulled down; I would look through wavy old glass rather than have it replaced by plate; but the methods and the ways of life that produced them belong to the time that is gone for ever, and can no more be called back than the Psalms of David can be written again.

I think Mr. Voysey is quite sound when comparing the past with the present. It is too true that, while we have gained knowledge, we have lost insight; we have got experience, but lost imagination; good taste is no longer spontaneous; the unerring instinct and judgment of the craftsman are gone, and we can no more work with the methods of the past than we can regain the blind unreasoning faith of our Calvanistic forefathers.

There are all sorts of questions about durability and cleanliness and colour on which I should have liked to join issue with Mr. Voysey if there had been time; let me merely interject here that in places where smoke and soot predominate the rougher and not the smoother a building is the better; for even soot will reflect light if it is in irregular lumps, but not when it is a smooth greasy skin over a polished marble or smooth ashlar surface.

It is to the main characteristics of sound and scholarly design that we must look in these days, not to the touch of the craftsman. To breadth and proportion, to light and shade, to balance and composition and contrast, to sound and obvious construction, to fitness, to beauty of detail, to cheerfulness and light. We are not German, or Italian, or American, or French, and everything will be done in our own English way; if we are all soundly taught, and taught on similar lines, our architecture will be worthy and dignified, free from vulgarity or untruth, and we need not fear that it will not be national. But to begin the whole thing anew and invent our architecture again or evolve it anew out of methods of building, while turning our backs on what the past has to offer us, merely because it may not be of English origin, seems to me to be to invite disaster and chaos; just as wrong as to destroy all our pictures and to learn painting again.

But let me conclude as I began, by expressing appreciation of the service Mr. Voysey has rendered to us by what he has been saying. He has initiated the discussion of a mater of great interest. He has condemned all that is mean or vulgar, sordid or dishonest; he has held up to us an ideal of the highest kind—an ideal that I believe myself to be incapable of realisation by reason of the conditions that now control us, but an ideal that he has put forward with sincerity and conviction; an ideal that we may always keep before us to correct our judgment, to form our character, and improve our aims. If we do not perhaps see eye to eye with him in the method of its attainment, we all share his hope that the architecture of our future shall be noble, pure, and inspired, worthy of its past, and in the highest sense national and expressive of national aspirations."

Mr. Harrison Townsend

said he thought Mr. Voysey would have done well to have given a definition of "patriot" at the beginning of his paper. Dr. Johnson said that a patriot was one whose real passion was a love of his country, and, although the dictionary might give that definition, it did not quite read into the word what Mr. Voysey had read into it, nor did it read out of the word that which Mr. Voysey had excluded. A patriot was a lover of his own country, but he was not necessarily a despiser of another country. Dr. Johnson had also said that "that man is little to be envied who would not gain force upon the plain of Marathon." There was a wider patriotism which did not exclude what could be gained from the teaching of other countries. He once asked a gentleman to go to Italy, and he said that the work was dreadful. His reply was, "If you don't go to look for what is good in it, go and see what is bad in it." The more evils one left uncommitted the more virtuous one was, and the more evils one sought to avoid in our work the better the working. After all, the whole sum of their knowledge was not great, and if they were to confine their knowledge to their own country, why not go further and make it a parochial thing and simply confine it to a district? He held that if they could increase their sum of knowledge by travelling abroad the better Englishmen they would be when they came back and knew how to apply their knowledge. It had been said that "Home-keeping youths have ever homely wit." Mr. Voysey might score on him by saying that was exactly what he wanted, but it was not the sense in which Shakespeare used the word. He did not think Mr. Voysey could have put a worse witness in the box for his own case; but out of thirty-nine plays which Shakespeare wrote not a third of them dealt with English subjects. Shakespeare went to Greece and Rome, and he transmuted what metal he brought back into a finer metal of his own English thought. Shakespeare did exactly what they wanted their young men to do when they went abroad; they wanted them to come back richer for what they had seen, but none the less Englishmen.

Mr. A. T. Bolton

said he was afraid the sentiment of the meeting was very much against Mr. Voysey's attitude, but at the same time they ought to realise the great influence which Mr. Voysey's work had had on people. It was extraordinary how men like Mr. Voysey with his intense convictions, and doing work of the character he did, had influenced the work of other people. When Mr. Voysey's work first attracted attention it raised great interest in him personally, because so much of it seemed to him influenced by the grand old cottages there were in Sussex. But much as one admired Mr. Voysey's buildings, he did not think they could accept his gospel. What may have answered very well in his own case might not answer in the case of others, and the basis of the whole thing, which was that they might do work without reference to what had been done in the past, was historically untrue. The more they came into contact with old buildings the more they realised that right into the heart of the Middle Ages the influence of Rome existed to a considerable extent. Many of the Romanesque builders were trying to do real Roman work. The remains of Roman work scattered all over Europe haunted the imagination of these builders. They went to Rome and came back, and thought they were building things in the Roman manner, and the importation of marbles and things of that sort went on constantly. Kent was a very bad county for Mr. Voysey to mention, because they had only to scratch the soil to find Rome. Seriously he believed that those students who had travelled most were those who best understood their native work. When they had spent any time in a country, as a rule they found out the local attitude and understood how certain features were the outcome of local conditions, and when they came back to England they generally understood better what the English peculiarities were. He thought foreign travel was positively beneficial in enabling people to understand their own country. The question of climate was a difficult one, and seemed much more plausible than it really was, because in France, for instance, the climate varied enormously, and so it did to a considerable extent in this country, and therefore they could not classify climate and say there was a definite English climate and an Italian climate, and so on. When one honestly tried to do a building which simply met the requirements of the case, giving the light and convenience, and using the material at hand, as a rule, people would say the general effect was dull, and they wanted something more. It was like the question put as to the arcades to old cathedrals. They were simply put there because people liked them. It was the same with these Orders and things which were introduced. It was easy to say they were not necessary, but if people liked them, and they gave a certain flavour to a building which did not otherwise exist, and they found they were used everywhere, then they must come to the conclusion that there was some human necessity for them. He could not sympathise with Mr. Voysey in his dislike to St. Paul's Cathedral, and he thought that gentleman had made an unhappy selection, because it derived its plan from Ely. Wren had a knowledge of Gothic architecture, for which he was not sufficiently accredited, and he understood the spirit and ideas of Gothic architecture. In St. Paul's Cathedral they had an extraordinary adaptation of English ideas with true Renaissance detail, and Wren was triumphantly justified in what he did, because St. Paul's

received the homage of a third of the population at the present day. When Turner said that St. Paul's made London he was expressing the sentiment which every Londoner had always felt. St. Paul's was not a mere copy of some Renaissance church, but it was in its way a very English design. The reason why they taught the five Orders was just this, that they taught the student a great deal about proportion. The Orders by thousands of years' use had arrived at certain results, and no student could possibly lose anything by studying a system of Orders which had been practised by so many distinguished men in succession. They taught also a certain independence for the moment of dimensions, and it was not a bad thing for the student to work out a design which was all related to one figure as it were. He obtained the idea that all details were related to the general result, and he learned a great deal if by applying the Orders to a design he learned to bring all the parts of the design in relation to a certain standard. As to the teaching of ethics in relation to architecture, Ruskin had tried to do it, and where he failed he did not think they would do much good.

Mr. Allan Potter

said he had a great deal of sympathy with Mr. Voysey's point of view if he read it aright, viz., that he was up against students going abroad and being struck with something pretty, coming back here and reproducing it in England with no direct relation to English architecture. That was as far as he went in sympathy with Mr. Voysey. When Mr. Voysey said they ought not to teach the Orders, he believed he was absolutely wrong. They ought to teach the Orders of architecture just as they taught Latin and Greek. It was not that they should write Dog-Latin, but that they should write good English. They wanted free thought and logical and scholarly study of the architecture of the past. They did not want to study either the Parthenon or St. Paul's in order to copy them. Westminster Abbey was inevitable in its day, and so St. Paul's also was inevitable in its day, owing to changed circumstances and changed social conditions. But because St. Paul's was suitable to its day it did not mean that it would be suitable for to-day. They ought to look to St. Paul's and to Westminster Abbey in order that they might produce equally fine architecture and suitable to the present day, as were these buildings to the day in which they were built. The Greeks started with what their ancestors left them, and discarded that which was inharmonious and unsuitable, and the result was that they produced style. An intense study of Greek architecture would teach them what was meant by style.

Mr. H. W. Brittain observed that what Mr. Voysey was really against was the spirit of the times.

Mr. A. E. Bullock

remarked that in all things this country depended largely on foreign importations, and if they had to depend solely on their own productions they would starve. They had adopted a great deal in classical architecture, but there was one thing they had yet to adopt, *i.e.*, interior decoration. If they could treat style of foreign work, thoroughly understood and produced, they would find their architecture would put on clothing which would make it more presentable and satisfactory.

Mr. C. G. Boutcher

said Mr. Voysey had told them that fitness was an essential. That being so, if they depended for their teaching on this country alone they would have to adopt the old Moot Hall for their town halls, and he thought Mr. Voysey would hardly say the old Moot Hall was suitable for the new London County Council offices. They had no tradition of their own in public buildings, and therefore they must go abroad and get the best they could.

Mr. A. Smithers

asked what would be considered local material in London, and also if Mr. Voysey would allow ferro-concrete to be faced up.

The President

said he must admit that his sympathies were really with Mr. Keen. Mr. Voysey, in the expression of his strong individuality, had really quite over-ridden some facts of history. He did not think they could argue from the local material standpoint so strongly as Mr. Voysey endeavoured to do, because the Greeks always disguised their materials. The early English craftsman always whitewashed his church or cathedral. He thought, however, that they would all agree with the noble ideals the author had put before them.

Mr. Voysey,

in reply, said he was surprised at the courtesy he had received, seeing that he had come to throw mud at their idols. They had all shot at him, but he did not feel the least killed. The point he wanted to make was that they should get their architecture from within, and not apply it from without. It was true that there was always chance except in one thing, and that was in moral sentiments, and those were the things they had to hold on to if they wanted to help one another, and it was out of those moral sentiments that the finest architect had ever come and ever would come. The whole trend of the discussion seemed to be that they had far better go on crutches than try to walk alone; and if they had only one leg perhaps they had better.

It was announced that the next meeting would be held on April 15 when Mr. Laurence Weaver will read a paper on "Some Scottish Houses of the Renaissance," and the election of officers for the Session 1912-13 will take place.

THE CARPENTERS' HALL LECTURES:

THE CRAFT OF THE BRICK AND TILE MAKER.

THE ninth of the present series of lectures at Carpenters' Hall on the Arts Connected with Building was delivered on Wednesday last week at Carpenters' Hall, London-wall, by Mr. W. R. Hoare, whose subject was "The Craft of the Brick and Tile Maker."

The lecturer, who showed a collection of bricks and tiles, said:—In considering effects of brick and tile he would presume that his hearers were only interested in what can produce a true artistic effect, and he would therefore eliminate all methods of producing bricks and tiles by machinery on the ground that, while it may be possible to produce a building or a group of buildings with machine-made bricks or tiles, which may have a not unpleasing effect at a distance in a dull light, it is only in the hand-made goods that the craftsman's art appears; he would therefore deal with the hand-made, sand-faced brick and tile as it had been made in the South of England since the days of the Romans.

Materials.

To deal first with the materials, clay exists in varying quantities in big beds or in "pockets" in a great many places in the South. The best clays for the hand-maker are those on the surface, which are mined to a depth varying from 6 ft. to almost 40 ft. The clay is dug in the winter, exposed as much as possible to the disintegrating forces of the weather, must be totally free from any gravel or lime, and, when fit for use, must be tempered with water by hand or machinery to about the consistency of mortar, when it is fit for use in the mould.

The other main material is sand. This was used, in the first instance, quite dry and sharp, in order to enable the moulder to disengage the warp of the clay from the mould without damage to the sharpest arris of his brick. It plays a very important part in the subsequent colour and texture of the brick. It is perhaps necessary to point out that where the best clays are used no sand is mixed with the clay; it is only applied to the surface of the brick in the mould.

The moulds are all made of the finest beech of at least four or five years in plank, shod with hoop-iron. In the old days wood and gorse were almost exclusively used for burning, but with dearer labour and improved transport coal has become the only possible fuel.

In making, bricks can be divided into two classes—those which can be made and dried in the open air from about April 1 to October 10, and those which must be made in the sheds and dried evenly without extreme variation of temperature. The first class includes all bricks which are used in the main body of a building from 1¾in. to 2¾ in. thickness.

These are made in a slip mould which has no bottom or top, only a case with four sides fitted on to a stop on the brickmakers' table. The "frog" is on the stop, which is the sand face of the brick, the surplus clay being struck off the top of the mould with a wooden strike; it follows that if bricks are required to be laid flat showing a sand face they must be specially made in a mould with no frog, a fact which is not always borne in mind. These bricks are then put down to dry in the open air on long wooden hack boards and protected from the sun, wind, and rain by "caps" and "lewe" boards until they are dry enough to stand the weight of many tiers in the kiln; generally speaking, it requires about a month for this. Needless to say, frost is the one enemy against which it is impossible to guard in the outdoor process, as it ruins any bricks which are not comparatively dry.

Any bricks or tiles thinner than this have to be made in sheds, because too rapid drying, either from heat or wind, causes them to crack.

This also applies to delicate-moulded bricks in which the thin edges, if allowed to dry more rapidly than the body of the brick, crack and spoil.

Under the stress of modern conditions the effect of the brickwork in the main body of the building is quite as important as the finish of the detail, and in one respect the moulder's work is perhaps the most important.

Texture is produced entirely by the moulder; in the first place, the way in which the warp of the clay is handled, giving the big wavy lines, and secondly in the free use of dry sand, which produces the minor inequalities on the sand surface of the brick to be seen after burning when the free sand comes away. Apart from this, it is necessary that every brick should be the result of a uniform amount of pressure into the mould, or else there will be an uneven shrinkage in the drying and burning.

In a stack of bricks sixteen courses high it is quite easy to identify those made by a big, strong man using much force from those made by a small man; there will be 2 in. or 3 in. difference in the height of the stack. It is also essential to guard against sand flaws; a slovenly workman in shaping his warp will allow the sand face to get rolled into the brick, at which point the brick will be unsound and part.

The other all-important feature is the colour of the brick, and this lies in the department of the manufacturer. Colour depends upon three things—judicious use of materials (clay and sand), the kind of kiln, and the amount of fire given to each individual brick in the kiln.

Colour Effect of Materials.

Roughly speaking, it is the amount of oxide of iron present in the clay and sand which determines the colour of red bricks, and, as this varies with the beds of clay, the brickmaker has to adjust the other circumstances to suit the materials. We have been unable to determine how far sand, used only externally for moulding, can effect the colour of the bricks. This much is certain, that it is possible by use of a good sand to burn colour an appreciable distance into an inferior clay; further, that, by using a great many different sands for moulding, you can produce quite distinct shades of colour in the same kiln, but there is no evidence to show after what lapse of time this colour effect will wear off the brickwork. In any case, it is quite clear that the prime necessity is a good foundation colour in the clay itself, which will stand the test of all time and only improve with age. Whatever sand be used the body of colour in the clay will show wherever a brick is chipped, and predominate eventually in a large face of the brickwork. We look, therefore, to the inherent colour in the clay for the main effect of colour, but can vary it to a limited extent by the use of sand.

Pigments.

Perhaps this is the right place to mention the use of pigments. It may be possible with these to produce an effect which is for the time pleasing. There are in particular some

stained tiles which seem to stand the test of time, but the whole question turns upon a much larger one, *i.e.*, the period at which the architect wishes his building to arrive at maturity. Often it may be necessary, for instance, to match old work in an addition to an existing building; or the juxtaposition of mellow brickwork may make it imperative to anticipate nature. At the same time, we submit that fire judiciously applied can give an effect which will satisfy the requirements of the present and be infinitely more beautiful to the generations to come. For this reason he passed over as unworthy of the highest craftsmanship the use of pigments in brickmaking.

Kilns.

There were three classes of kilns which need be considered (burning bricks in clamps might be dismissed from consideration as pertaining solely to the realm of cheapness without a chance of beauty) :—The Scotch kiln, which was a square case with fire-holes level with the ground, the fire passing upwards through the bricks; down-draught kiln, with a domed roof, in which the fire, applied through fire-holes as in a Scotch kiln, is carried up in chimneys inside the kiln above the bricks, and descends through them to a flue in the centre of the kiln, thence underground to a shaft close by; continuous kiln, in which the main principle was a succession of chambers, the heat from one chamber being used to dry the bricks in the next with a great consequent economy in fuel.

There are still in existence a few old kilns in which wood can be used for burning, with the result that you obtain a fine glaze on the brick, which is accentuated by the use of furze in the final stages. But these are so uneconomical that they have practically died out; one man can only burn about 14,000 bricks at a time, where he can burn 50,000 to 60,000 in a Scotch kiln, and a much greater number in a continuous kiln.

Still, we must recognise the fact that the bulk, if not all, of the beautiful old brickwork in the South of England was produced from kilns fired with wood at the time when the transport of coal must have been a serious problem. Now, however, coal is the universal fuel.

In dealing with this question of colour, by far the best results are obtained from Scotch and domed kilns, which do not suffer from the deleterious effects of steam from the drying bricks. The bricks in the kiln nearest the fire will contain a large proportion of flared bricks, which can be set so as to receive the flare upon either the header or stretcher side. Through the middle of the kiln are obtained good dark and medium-coloured bricks, while there must always be a certain proportion of light bricks furthest from the fire.

It follows that when a certain range of colour is required it can be obtained by regulating the place of the bricks in the kiln, and great variety can be obtained in the actual setting of the bricks, as, for instance, the bars of flare which come when the bricks are placed crosswise over the fire-holes.

If the bricks put into a kiln are reasonably dry, the first part of the burning, "the drying," should not take more than forty-eight to seventy-two hours. This is done slowly with small fires until all the steam has been driven out of the bricks. The burning proper then begins and may take anything from fifty-six to 100 hours, till the whole kiln is one incandescent mass of light primrose fire. At the proper moment the fire-holes are damped down with clay, as cold air entering a hot kiln will crack everything with which it comes in contact. The kiln remains closed for about forty-eight hours, and after this time is cooled quickly.

A Scotch kiln can be emptied within one week of burning, kilns with domes or chambers taking neessarily longer to cool.

From what has been said it will be seen that the whole process, allowing for about three days to set a kiln, takes between six and seven weeks. This applies to normal weather and circumstances. In the winter, when all bricks have to be dried artificially, or when at the beginning or end of the season there is very little drying weather, longer time will be required. Any order for bricks requiring special attention should be given ten weeks in advance. This should allow time for them to be given their proper place in the right kiln.

Shrinkage.

There is another question in view in that of colour, *i.e.*, the shrinkage of the brick. Happy is the brickmaker who has to work only one class of clay with shrinkage at a constant ratio.

The bulk of the shrinkage takes place before the brick reaches the kiln. To take the case of my own bricks, these will have shrunk from 13½ in. as they leave the mould to 12½ in. when they are fit for kiln; fired to medium colour, they will emerge from the kiln at 12 in. Should it be necessary, however, to fire them harder, anything up to an extra ½ in. will be added to the shrinkage.

Many clients who desire bricks with all the various shades of blue that fire will give are apt to forget that this involves a greater contraction.

It is especially necessary to note that if perfectly true results are required in moulded bricks they must all be burned to one colour on the light side of medium.

Any attempt to impart special colour to moulded bricks burned over a series of kilns will inevitably involve some inequality in shrinkage. Uniformity is quite easily obtainable, but at the expense of appearance. He was personally of opinion that the slight play given to a medium-covered brick through the centre of the kiln rather adds to than detracts from the charm of the gauged brickwork.

Moulded Bricks.

The slip mould is a square box, costing from about 5s. to 30s. The difficulty of dealing with moulded brickwork lies in its complexity. To start with, we make bricks in varying thickness from 1 in. to 2⅝ in. In many of the ordinary patterns we have to stock these in various thicknesses with internal and external angles of different degree, of which very few will be used at a time. A moulder, however heaven-born a genius, always takes some time to adapt himself to each fresh mould.

It is very much cheaper to make each section by the 1,000 than the 100, or by the 100 than in units. The cost of moulds also becomes a much less serious consideration if 100 are made out of a mould costing 1*l.*, than if only four are, as is sometimes the case. What I am driving at brings me on to difficult ground, but the whole future of moulded brickwork seems to me to turn upon it—that is, the recognition by architects of the fact that the interests of their clients demand some alterations in the etiquette of the business. It is extremely difficult, with the best intentions, to draw the line at what is or is not the private copyright of any man ordering a design. The time will come, if brick designing is to go ahead, when each designer will feel justified in accepting designs in existence and not, as often now, go through the farce of some trifling alteration which may involve a whole set of new moulds.

Limits of Moulded Bricks.

It may be desirable at this point to mention what are the reasonable bounds of possibility in moulded bricks; whereas plain straight bricks and tiles can be made 18 in. long, and made quite true and sound, it is not desirable to make ordinary moulded bricks more than 14 in. in length. The dimensions are finally governed by the weight of clay that a man can lift to put into the mould.

It is difficult to realise how seldom the moulder has the opportunity to see his handicraft in the building when complete. In one of the first moulded houses we undertook the lady client invited all the party to tea and see the work. It was quite touching to see the pleasure given to old moulders in tracing their bricks through the building and seeing how they came in.

It is regrettable to find that the old race of hand-moulders is dying out; whereas it used to be the custom for all the boys of the family to help the fathers in the yard from very early years, it is now the rarest thing to find a boy. There will in ten years be a great scarcity of men coming on. The life is a hard one, but a good man can earn good money at it.

Some system of apprenticeship will be necessary if the trade is to survive.

Matching Old Work.

It would be impossible to pass over what is a most important feature of the craftsman's work, *i.e.*, the suiting of his material to its surroundings. It is quite a common thing nowadays to ask the brickmaker to match a building 100 to 200 years old. This is all very right and proper where an addition has to be made to an existing building, but it is open to doubt whether it is a sound art to aim at producing ready-made what is really the effect of centuries. It provides the brickmaker with much of his most interesting work, but often taxes his ingenuity and the resource of his yard and district beyond endurance.

THE INTERNATIONAL SMOKE ABATEMENT EXHIBITION.

An International Smoke Abatement Exhibition, organised under the auspices of the Coal Smoke Abatement Society, was formally opened on Saturday last week at the Royal Agricultural Hall, Islington, by the Duke of Argyll, the President of the exhibition.

At the subsequent luncheon, at which Sir William Richmond presided,

Sir William Ramsay, K.C.B., LL.D., D.Sc., F.R.S., President of the British Association, in proposing "Success to the Exhibition," suggested that just as deposits of salt were worked, not by mining the salt, but by pumping in water which was recovered as brine, so it would be ideal, instead of mining coal to have retorts in the bowels of the earth for the production of gas. A boring might be put down to the coal strata, the coal might be lighted where it was, and air and water might be passed down so as to produce hydrogen and carbon monoxide. The resulting gases might be used in gas engines at the pit mouth for the production of electricity, which might be distributed by high-tension currents to any desired point. That would settle the strike problem, and he suggested that the miners should consider very carefully what they were doing, lest it should be found that the country could do without them. The resources of science were not exhausted, and a plan such as he had suggested might enable electricity to be used for heating, at a price of perhaps one-hundredth of a penny per unit.

Sir William Richmond, K.C.B., R.A., President of the Coal Smoke Abatement Society, in reply, said what we had to do was to enlist public opinion upon the subject—to interest it and to remove if possible a certain apathy which belonged to the strength of the English character. The Exhibition ought to enlighten the public, for the appliances shown were numerous and ingenious and not unlovely. However firmly they might be attached to science, they would admit that Beauty had, independently of other things, a great function to perform in the world—a function which was ennobling and refining. The English people once had it in a large measure, and he believed they would again possess it. Through their efforts we should have again a white city and a healthy people.

Dr. H. A. Des Voeux then proposed the toast of "The Visitors," which was responded to by Mr. Goff, L.C.C., Dr. Shaw, Director of the Royal Meteorological Council, and Dr. Bostock Hill, President of the Medical Officers of Health.

SMOKE AND BUILDINGS.

In connexion with the Exhibition during the present week a series of conferences have been held dealing with the whole subject of smoke prevention and abatement. The first sitting was held on Tuesday, under the Chairmanship of Mr. W. Whitaker.

Mr. L. W. Chubb (the Secretary of the Smoke Abatement Society) said there were seventy-one public authorities taking part in the conference, of whom twenty-one were Metropolitan Borough Councils. There were also representatives from the London County Council, from the Swedish and Dutch Governments, and from America. They had arranged visits to the Becton Works of the Gas Light and Coke Company, which was the largest gasworks in the world; to the Lots-road generating station of the Underground Railways Company; and to the Greenwich power house of the London County Council.

D

Effect of Smoke on Building Stones, etc.

Sir Wm. Church, in a paper on "The Action of Coal Smoke on Building Stones and Mural Paintings," said it might be affirmed that whatever be the injurious effects of the carbon and mineral waters in smoke upon the processes and functions of organic nature, it was not to these constituents, were they unaccompanied by other substances, that the damage done by coal smoke to building stones, to mural paintings, and to objects of metal could be attributed. They soiled and disfigured, but they did not, *per se*, corrode and disintegrate and alter. The offending constituents of soot were those which were associated with having been absorbed by the carbon which formed its basis. It had been estimated that the sulphur present in the coal annually burnt in London gave rise to an amount of oxidised sulphur compounds corresponding to half a million tons of sulphuric acid, or oil of vitriol. This compound soon oxidised with sulphuric acid, which was the chief destructive agent present in urban atmospheres. He might cite many instances of decayed stonework to prove this pointby the analysis of samples from buildings in Oxford, Canterbury, and London. For instance, the outer face of the Sheldonian Theatre at Oxford contained no less than 19 per cent. of gypsum, all save the veriest trace formed from carbonate of lime by the attack of atmospheric sulphuric acid. Magdalen College tower gave him more than 11 per cent. The interior walling of Westminster Chapter House contained just 18 per cent. of the same product, while St. Paul's Cathedral furnished a most striking instance of the destruction wrought by the suphuric acid in London air and rain. There was a blackish stalactitic incrustation hanging to the under side of the cornice above the colonnade and below the dome. This was some inches deep in places, and contained nearly 74 per cent. of gypsum or hydrous calcium sulphate. Whence did this deposit derive its sulphuric acid constituent if not from the sulphuric acid wasted out of the London air by falling rain. Soot falling upon some stones other than those which contained or consisted of calcium carbonate exerted upon them also a destructive action. If granite or other allied stone practically escaped corrosion, stones like serpentine, of which the main part was a hydrous magnesium silicate, were rapidly corroded, soluble magnesium sulphate being found to be washed away in the first shower. Sulphuric acid, again, was the chief culprit where paintings in true fresco were concerned, but there was one advantage which fresco enjoyed in comparison with the methods of oil and spirit fresco, viz., that when besmirched with tarry matter from soot and smoke this discoloration might be removed without interfering with the pigments. To show how the most solid gilding failed to preserve metal from corrosion, he might cite the gilt bronze screens at either end of the reredos at St. Paul's. These had been subjected to an atmosphere polluted with sulphurous acid escaping from stoves burning coke in the basement of the Cathedral. Modern research had shown how difficult and how well-nigh impossible it was to form an absolutely non-porous and continuous coating of one metal upon another. If cracks and other breaks in continuity were at first imperceptible, yet the unequal expansions of the two metals in consequence of temperature changes might soon develop them. In some such way one might account for the thick bluish-green crust, containing copper sulphate, which disfigured the gilt bronze grilles or gates in St. Paul's.

Mr. Noel Heaton

then dealt with the actual effect of damage from smoke on decorations which had come under his own practical knowledge. With regard to windows, stained glass should be little affected by smoke if properly executed. The gradual decay of the glass which was so noticeable in old windows was due to several causes, and although these were decidedly aggravated by contamination of the atmosphere, there was no real excuse for the premature decay one noticed in some modern windows, which was due to the use of improper materials and the improper use of materials. Both the glass and enamels used in properly executed modern windows were extremely resistant to decay, and the constant changes of temperature necessitated by modern needs in the way of warmth and light were far more potent factors in decay than smoke, the effect of which was practically limited to the dimming effect of the actual dirt. Passing to the question of the effect on the exterior painting of houses, he pointed out that the National Association of Master House Painters recently conducted a series of practical tests of paints, and whilst these tests could not be looked upon as in any way final, yet the general conclusion one arrived at was that smoke is by no means the most potent factor in the actual disintegration of the paint film which took place more rapidly in pure air and bright sunshine of the seaside than in the great cities. They must, however, remember that the surface of oil paint was by no means impervious to moisture, and smoke might under such conditions exercise a very insidious destructive action on the pigments mixed with the paint and the surface which the paint film was intended to protect, whilst leaving the paint itself undamaged. The effect of the smoke was more clearly felt in the case of works of art which form the permanent decoration of a building. In order to be seen properly in the comparatively dim light of the interior, mural paintings must be clean, and in a smoky atmosphere constantly depositing dirt this necessitated constant washing. The smooth, varnish-like surface which alone would resist the adhesion of dirt and admit of being washed without mechanical injury was, however, extremely objectionable in a work of mural painting decoration; and, on the other hand, the matt absorbent surface which enabled the design to tell to the best advantage offered such a foothold for dirt of the adhesive nature derived from smoke that it was practically impossible to clean it efficiently. Decay of the pigments of a mural painting should not fairly be attributable to smoke, however, for it is quite possible to execute any internal painting or decoration with pigments that were perfectly stable and proof against attack, given sufficient technical knowledge and experience on the part of the artist. When they considered paintings executed on the plaster of the wall itself, either in oil or tempera, the effect of smoke was more disastrous, for the active agents of corrosion passed through the paint and attacked the plaster behind, with the result that one frequently saw such paintings peeling from the wall in places owing to the disintegration of the surface of the plaster. The destructive effect of smoke was, however, seen at its worst in the case of fresco paintings, for there they had of necessity a surface composed almost wholly of carbonate of lime in a porous condition, to which the dirt adhered so tenaciously as to be almost impossible to remove, and which was, moreover, attacked by the dilute acids in the same way as limestone, only more readily, because of its comparatively soft condition. Under normal conditions fresco was the most permanent, as well as the most beautiful, form of decorative painting, but under modern conditions some preservative treatment, such as impregnation with wax, which inevitably resulted in the loss of some of its charm, was absolutely necessary to protect it from rapid decay. It was scarcely too much to say, in fact, that the smoke nuisance had in towns rendered the execution of a satisfactory and permanent work of decorative painting one of the most difficult problems of applied chemistry.

Mr. H. Redfern, F.R.I.B.A.,

said the architect knew very well from experience that if he built in the country, right away from towns, his building from the time it was finished began to improve in appearance, and so long as it stood continued to improve, for Nature, if left alone, harmonised everything with herself. On the other hand nowadays he knew also that if he built in a town, his building never looked so well as when it was just finished. Legal prohibition of the use of sea coal in towns continued in force up to the middle of the XVIth century, and after the lapse of these Acts limewhite and pure colour little by little disappeared from towns, and so at length they came to take on the dingy, sooty, and dejected aspect which they now presented, for the use of either pure white or colour was impracticable in the towns of to-day. As in towns, the exercise of man's function of colour vision on natural features was impossible. He instinctively made an effort to supply the deficiency by applying to the surfaces of his buildings fresh and bright colours, low-toned in large masses, and high-toned in small, but always luminous. For many years now, however, the effort had been abandoned in despair, for in towns to-day no colour, however bright or highly glazed, would keep its purity for more than a brief season. For the architect coal smoke made pure colour effects impracticable, and for the expression of his art he was confined, both in mass and detail, to play of light and shade and variety of outline. But even in these means of expression he was, by the curse of coal smoke, very straightly limited. In London no less than 650 tons of soot fell per annum on the square mile. To the architect the news came with no surprise, but he had always been conscious that it was a thing which constituted a serious factor among the many things which imposed restrictions upon his use of the means of expression of his art. It was evident, from the example they had had in such cases as the York Water Gate on the Victoria Embankment Gardens, that soot deposited on architectural features must in time cause a considerable alteration of their original forms, filling up recesses and marring the purity of the outlines. A much greater evil, however, was that of erosion arising from the by-products of coal combustion. From the moment the live stone was exposed to the influence of smoke-polluted atmospheres it began to deteriorate. It was clear that the architect who considered the future appearance of his stone buildings must take into consideration the two factors of soot deposit and erosion, and that unless he made up his mind to forego all effects which might be attained by undercutting, delicacy of incised line, and sharpness of angular forms, his building would very soon lose its original force of expression, and would degenerate into a mere mass of dirty and shabby masonry. It was in stone that the troubles were chiefly in evidence, but woodwork and metalwork was affected, and in this regard the appearance of their public statues and monuments would speak for him. He submitted that by this curse of coal smoke the architect and the sculptor suffered the most grievous restrictions in the exercise of his art, for not only was he subjected to the malign influence of the smoke on his materials, but by the smoke pall he was robbed of light of the quality required for definition of form. Dealing with what the architect was doing to mitigate the evils which arose from coal smoke, Mr. Redfern said the method at present chiefly in use for limestones was the Baryta treatment, first advocated by Sir Arthur Church, and it was the method advocated by the Society for the Protection of Ancient Buildings, and lately used by the Architect of the London County Council in consultation with the Chief Chemist of that body. The Society for the Protection of Ancient Buildings also advocated the use of repeated coats of thin limewash, made by slaking lias lime with boiling water. Fourteen years ago Mr. Thackeray Turner coated decaying stone at Hatfield Church with slaked lime in a thin liquid state, and so far it had shown no sign of further decay. When Baryta was used the Society strongly advocated finishing with one or two coats of limewash, particularly for porous stones, and in cases where the use of Baryta had resulted in an unpleasant colour. The author spoke at some length on the methods adopted with regard to the York Water Gate, where recourse had to be had to watering with a solution of caustic soda and spraying with a jet of steam to get rid of the bituminous deposits on the stone. After cleansing, Baryta water was applied until the stone would take up no more; the average number of coats given was eighteen. About four weeks after the completion of the work an analysis of the stone disclosed that the Baryta had entered into combination with the stone for a depth of at least ¾ in. from the surface, having the effect of converting the decayed stone into a weather-resisting substance. Building stones other than limestones were not so much affected chemically as mechanically by the soot, which encouraged the absorption of rain water into the joints and held it under projecting features, with the result that frost caused

damage. To these stones the Baryta water treatment was not applicable, and water-proofing must be resorted to. Most of the compositions on the market for this purpose were not permanent, but the old method of a coat of soft soap followed by a coat of alum dissolved in water was efficacious. Another method was a solution of ceresin wax in petroleum solvent, applied whilst the stone was warm and dry. Statuary was sadly affected by smoke, and all that could be done was to keep it clean by washing, and protect by a thin layer of some water-proofing solution, such as the ceresin wax with perhaps a little copal added to prevent stickiness; but in these cases surface textures had to be carefully considered. In conclusion, Mr. Redfern directed attention to the obstacle presented to an appearance of cleanliness by the presence of the bituminous deposits, and said the effect of the deposit was plainly apparent in cases where white-glazed brick surfaces on painted buildings had been washed down. Therefore, so long as coal smoke continued even building in glazed brick or faïence could not, in the long run, retain it original purity of colour.

Dr. S. Rideal

followed with a paper on "The Effects of Town Air on Metalwork," in which he dealt with a number of remedies for the evil adopted in this country and abroad.

Mr. Walter Reid, F.I.C.,

thought that architects were to be blamed somewhat for using the materials they did under the existing conditions. There had been a good deal of money raised lately for monuments to King Edward, and he was sorry to see that most of the designs included such things as bronze and marble, which were the very things which should be avoided, for their climate was not fit for such materials. He remembered when the Tivoli, in the Strand, was built there were some beautiful marble columns and some bronze work above, but in a year it could not be recognised. They could also see that the limestone on which the Gladstone statue in the Strand stood was turning a bright green. In Berlin they had carried out a serious movement with regard to building stones and bronzes, and had taken a leaf out of the book of the ancient Greeks, who devoted two days in the year to rubbing their statues with oil. As the result of the experiment in Berlin they had found that animal oil was the thing which gave the best results. Paraffin wax was very well while it lasted, but it did not last long on metal. It was better for stone, and he preferred it to Baryta water. He understood that at Canterbury Cathedral they had experimented with arsenic acid to protect the stone with successful results.

Mr. Kinnaird,

of the Battersea Borough Council, said he was a practical builder, and only the previous day he had been called to see the side of a house which had been painted and which had turned black owing to the effect of the sulphur in the air. There could be no doubt that the great loss of money arose from the action of sulphuric acid on paint in London in the way of changing the colour.

Mr. Watling (Bedford)

said that most of the public buildings in the West Riding of Yorkshire were of sandstone, and there had been a considerable amount of blackening. He would like to know what Sir A. Church would suggest should be done to restore them to their original colour without damaging the surface of the stone.

Sir A. Church

said he did not know whether the process of saturation would be of any use with sandstone, but with paraffin wax they could render the surface non-absorbent.

At succeeding meetings a large number of papers were read on different aspects of the question of smoke prevention. These included the following:—"Progress of the Smoke Abatement Movement in Germany," by Herr I. Wies; "Smoke Abatement in America," by Mr. T. E. Donnelly; "Solid Smokeless Fuel," by Mr. W. D. Scott-Moncrieff; "Proposed Legislation," by Mr. J. W. Graham; and "Smoke and Fog," by the Hon. Rollo Russell.

[*** Some notes of the exhibits will be given in our next issue.—ED.]

TESTING OF MATERIALS USED IN REINFORCED CONCRETE.*

IN our last issue we gave the first part of a paper by Mr. A. Alban H. Scott on the Testing of Materials used in Reinforced Concrete, read before a meeting of the Society of Architects. We now give the remainder of the paper and some notes of the discussion which followed:—

TABLE 4.—RESULT OF GRADING OF SAND.

Sand.	Retained on 30 × 30	Passed 30 × 30, Retained on 50 × 50	Passed 50 × 50	TOTAL.
Sample 1	29·0 p.c	15·5 p.c.	55·5 p.c.	100·0
Sample 2	48·2 p.c.	11·0 p.c.	36·8 p.c.	100·0

Effect of "Flour" in Concrete.—The question has often arisen as to the effect of very fine sand, or so-called sand, on concrete, and we have had two series of tests carried out on materials of this nature.

Table 4 shows the result of the grading of sand. Table 5 shows the test on cement used for the specimen pieces.

Table 6 shows the result of tests to ascertain the resistance of thrusting stress on standard sand and cement.

Table 7 shows the result of tests on the briquettes containing the very fine materials.

TABLE 5.—TEST ON CEMENT USED FOR TENSILE TESTS.

Briquettes 1 in. by 1 in.

Neat Cement.	3 parts Standard Sand to 1 part Cement.
Lb.	Lb.
572	196
527	238
570	206
551	192
556	191
Mean of 5 tests, 555·2 lb. per square inch.	Mean, 204·6 lb.

Age 7 days.

Residue upon sieve 50 by 50, 0·0; upon 76 by 76, 0·0; upon sieve 180 by 180, 10·5 per cent. Time of initial set (25 per cent. water), three hours; set hard, nine and a half hours. Pats remained sound in air and cold water, also in water kept at a temperature of 115-120 deg. Fahrenheit for forty-eight hours.

Le Chatelier Test for Soundness:—Cement ærated for twenty-four hours, expansion 3·5 mm.; after seven days' aeration, expansion 1 mm.; weight of cement per cubic foot:—

1.	86·56	Various methods of filling cubic measure.
2.	86·28	
3.	85·11	
4.	85·80	
5.	94·10	
6.	95·25	

TABLE 7.—TEST ON BRIQUETTES CEMENT AND SAND SAMPLES 1 AND 2 FOR TENSILE STRENGTHS.

Briquettes 1 in. by 1 in.

Sand Sample No. 1.

Lb. per sq. in.
112
104
102
103
100
Mean 105 lb. per square inch.

Sand Sample No. 2.

Lb. per sq. in.
178
180
170
191
164
Mean 177·4 lb. per square inch.

Proportions. 3 Sand 1 Cement.
Age. 7 Days.

It will be observed from these tests that the average strength of briquettes with standard sand and cement gave a mean of 204·6 lb. at seven days, whereas the sand (Sample No. 1) gave only 105 lb. per square inch, and sand (Sample No. 2) which contained a less amount of flour gives an average result of 177·4 lb. per square inch.

On Table 5 the extraordinary different weights per cubic foot of cement is given. The same cement was used, but different methods of filling were adopted. It certainly confirms the necessity of most carefully considering whether the cement for all work should be measured by weight and not by cubic measure.

Another test made, as shown on Table 8, shows that with standard sand we get 182·2 lb. at seven days and 234·6 lb. at twenty-eight days; whereas with the test on "flour" sand as described on the Table we only get 53·2 lb. at seven days and 104 lb. at twenty-eight days.

A word with reference to the testing of the finished structure may not be out of place.

Specifications often provide for the work to be tested with one and a half times the load for which the work has been designed to carry. A factor of safety of four is taken in the calculations to provide for inequalities of workmanship and materials, for allowance for fatigue of material under strain, and for isolated, accidental excess loading; considering that with one and a half times the safe load the concrete in compression is working up to 900 lb. per square inch, adhesion 150 lb. per square inch, 120 lb. in shear, and steel varying up to 22,500 lb. per square inch in tension; that by the application of such loads the parts so tested may be permanently injuriously affected.

If the materials are tested as suggested in this paper, and professional supervision is given

* Continued from page 337.

TABLE 6.—RESULT OF EXPERIMENTS TO ASCERTAIN THE RESISTANCE TO THRUSTING STRESS OF CUBES OF STANDARD SAND AND CEMENT.

Description.	Dimensions.	Base Area.	Crushed.	
			Total.	Per sq. in.
	Inches.	Sq. in.	Lb.	Lb.
From bin No. 22.	3·00 3·00 × 3·01	9·03	41,440	4,589
	3·00 3·00 × 3·00	9·00	43,480	4,831
Neat cement.	3·00 3·00 × 3·00	9·00	42,240	4,693
Age 7 days.	3·00 3·00 × 3·01	9·03	41,320	4,576
	3·00 3·00 × 3·02	9·06	41,000	4,525
	Mean	9·02	41,896	4,643
	3·00 3·00 × 3·00	9·00	10,420	1,158
3 parts standard sand.	3·00 3·00 × 3·00	9·00	11,080	1,231
1 part cement (by weight).	3·00 3·00 × 3·01	9·03	12,080	1,338
	3·00 2·00 × 3·01	9·03	10,440	1,156
Age 7 days.	3·00 × 3·00 × 3·01	9·03	11,400	1,262
	Mean	9·02	11,084	1,229

Not sufficient quantity of material of "sample sands," Nos. 1 and 2 to make comparative experiments to ascertain the resistance to thrusting stress.

TABLE 8.—RESULTS OF EXPERIMENTS TO ASCERTAIN THE TENSILE STRENGTH, ETC., OF CEMENT AND ROCK DUST, AND CEMENT AND SAND.

Twenty specimens moulded here, immersed in water and tested at the ages of 7 and 28 days. Briquettes, sectional area 1 sq. in.

CEMENT AND ROCK DUST. (3 parts Rock Dust to 1 part Cement, by weight.)							CEMENT AND SAND. (3 parts Standard Sand to 1 part Cement, by weight.)					
Age 7 days.			Age 28 days.				Age 7 days.			Age 28 days.		
Test No.		Lb.	Test No.		Lb.		Test No.		Lb.	Test No.		Lb.
QQ.			QQ.				QQ.			QQ.		
4586	...	64	4591	...	135		4603	...	194	4606	...	264
4588	...	56	4590	...	109	Received 8th Oct.	4599	...	184	4605	...	259
4587	...	50	4593	...	100		4602	...	183	4604	...	243
4584	...	48	4589	...	97		4600	...	177	4607	...	208
4585	...	48	4592	...	88		4601	...	173	4608	...	199
Mean of 5 tests...		53·2	Mean of 5 tests...		104·0		Mean of 5 tests...		182·2	Mean of 5 tests...		234·6

The Rock Dust used was that which passed through the 30 × 30 sieve. The Standard Sand was passed through 20 × 20 sieve, and retained upon 30 × 30 sieve.

The Tensile Strength of the Cement used in making the above briquettes was 480·0 lb. per square inch at 7 days and 583·0 lb. at 28 days.

Residue upon sieve 50 × 50, 0·0; upon sieve 76 × 76, 0·9 per cent.; and upon sieve 180 × 180, 15·9 per cent.

99, Southwark-street, London, S.E. DAVID KIRKALDY & SON.
Nov. 6th, 1908.

to the work, tests on the finished structure are not necessary; if it is desirable, then only the safe load should be applied; and if no undue deflection takes place no further loading can serve any useful purpose."

Professor Henry Adams, M.Inst.C.E.,
in proposing a vote of thanks, said when they spoke of a factor of safety of 4 to 1 there was really no such thing existing; the factor was merely to provide for things that one knew would happen but which could not be exactly measured, and he was of opinion that in at least 50 per cent. of cases a factor of safety of 4 to 1 was in reality only 2 to 1. The author was to be commended for emphasising the need for tests being made in accordance with actual practice rather than under laboratory conditions. It was for practical use that tests were wanted, and in such cases the conditions in actual practice should be taken into consideration. The testing of aggregate to ascertain its specific gravity was only required as an alternative means of estimating the amount of voids, otherwise he did not know that it was of any practical value. The testing of the water, too, he thought, was only necessary when the source of supply was doubtful or when there was some reason to suspect the impurity of the water. In paragraph 14 the author had stated that the cement for each six sets of specimens should be taken from the same consignment. He (the speaker) thought that that should read "each set of six specimens," because it was necessary in all tests to have a number in order to get a reasonable average; a single test would not do. The perfect set of tests would include such a number of specimens as would give practically a continuous curve passing through each of the groups, which was one of the values of putting tests down to curves. He supposed that the welds referred to in the paper were end welds, *i.e.*, for the purpose of lengthening a bar; but there could be no possible objection to the electric welding in the crossing of the various bars. It was where tension came in that welding was objectionable. As a rule, the strength of a weld was 80 per cent. of the original bar. The 30 per cent. referred to by the lecturer must have been an exceptional case. With regard to the consistency of concrete, the general preference among specialists was for it to be in such a state that, after being tamped, the water just floated on the surface and no more, and the concrete itself was in a quivering condition. The author apparently advocated a drier mixture, but there would then be a greater difficulty in getting it into actual contact with the rods, especially underneath them. A cubic foot of "Ferrocete" cement was said to weigh 76·2 lb., and the weight of standard cement, the author stated, was 90 lb. The specific gravity was specified to be 3·1, which meant 3·1 times the weight of an equal quantity of water; so that if a cubic foot only weighed 90 lb., 3·1 times sixty-two and a half was 180 lb., then there must be 50 per cent. of voids in "flour" cement, although it seemed to lie quite close. The mode of filling in the measure affected very considerably the weight of cement, and that was the reason why it was desirable to take it by weight rather than by measure. The figure of 76·2 would probably have been increased to ninety if the measure had been filled in the standard manner. The author had referred to the rate of testing briquettes of cement, and had stated that there was an increase in strength obtained by putting the load on suddenly. He (the speaker) thought Mr. Scott should have said "an apparent increase," as there was no more strength in the briquette than if the weight were put on slowly. The indication of greater strength by adding the load rapidly was more remarkable in the testing of steel, and he remembered that in the earlier days, with the old-fashioned testing machines of the long lever and scale-pan type, the operator was supplied with a number of weights of various sizes, and it required a great amount of dexterity on the part of the operator to change the small weights for a large one of equal value before going on again with the small ones, the object being to get on as many of the weights as possible before the metal gave way. That was at a time when there was no recognised rate of applying the load.

Mr. E. C. P. Monson (Vice-President) seconded the vote of thanks.

Mr David Kirkaldy
said he was quite in accord with Mr. Scott in his remarks about the coating of grout, and he was very glad to hear from Professor Adams that the point would be got over in the final rules.

Mr. S. Bylander
said he had personally found it a very difficult matter to submit the various materials to tests. In the construction of the Automobile Club some hundreds of tons of cement were used, and he was very anxious that it should be properly tested. He therefore arranged that the cement at the works should be placed in bins and sealed, and then samples taken and tests made, and when found satisfactory the cement was to be taken to the job. The principal difficulty in carrying out more exhaustive tests seemed to be the question of cost. With regard to the testing of finished concrete, he thought it would be an advantage to have some rule to work by, and he hoped that the Engineering Standards Committee, or some such body, would take up the matter and issue some sort of rule. With regard to the form of the test pieces, he certainly thought 4 by 4 was not satisfactory, the aggregate used being too large in size to be properly placed, a 6 by 6 would be much better. The strength of steel being 62 272 lb. per square inch, he would like to know why Mr. Scott limited the tensile strength to 72,000 lb. He did not understand the author's reference to the elastic limit of steel. His (the speaker's) idea was that it was necessary to have a high elastic limit, because it was really that which determined the safety of the structure, and not so much the ultimate strength of the material. They did not wish to have a very hard steel, because it was brittle.

Mr. G. A. T. Middleton
said it had rather surprised him that both Mr. Scott and Professor Adams had remarked upon the fact that cement was now tested by weight per cubic foot, and he thought it would be very much better to test by specific gravity.

Mr. P. M. Frazer
said he thought that they did not quite realise that cement and steel could only be tested under laboratory conditions, which argued that the testing of made concrete was more valuable than the testing of cement and steel. No means had been devised, so far as he was aware, for testing reinforced concrete blocks, and it had often occurred to him that there should not be much difficulty in testing a 12-in. cube of concrete slightly reinforced. As to the speed of testing and the running up of the apparent strength, a few weeks ago he had been present at some testing operations at the makers'; he had asked permission to use one of the machines, as it was obvious that the men were testing too quickly. Upon easing the rate of loading he obtained much lower results, with the obvious retort that he knew nothing about testing. With regard to the weight of cement and concrete, some added by weight and some by volume, but he, in his specifications, got over the difficulty by weighing the cement on the job and altering the size of the gauge-box to accommodate 90 lb.

Mr. J. Herbert Pearson and Mr. H. T. Cover having spoken,

The Chairman
said he had had very little experience in the use of reinforced concrete, but what he had done had not turned out very satisfactory, nor had he found it cheap. He had recently had occasion to use it to carry a surface drain where the foundations were too bad to support it in the ordinary way, and the local authority had required him, on a 14-ft. span with a beam 18 in. square, to use 2 in. of steel. He might just as well have used steel joists. The supervision of reinforced concrete work put additional responsibility on the architect, who, if he undertook such work, should be paid not only for his professional services, but for acting as clerk of works also.

The vote of thanks having been heartily agreed to,

Mr. Scott,
in reply, said with regard to the question of the weight of cement he believed that in the original Report of the R.I.B.A. Sub-Committee on Reinforced Concrete the weight was specified 76 lb. per cubic foot, and the tests in the tables referred to were made under the same conditions, and since then the 90 lb. had been adopted. The question of the weight or measure of cement was far from satisfactory, however, and, as Mr. Fraser had said, they always adopted a method of testing the weight of cement per cubic foot, and they would see at the bottom of one of the tables the extraordinary results they obtained. They so increased their cubic measure as to accommodate not less than 90 lb. It was a fairer way both to the contractor and to the client, and it certainly got rid of carelessness on the part of workmen in throwing aggregate into the scales. There was enormously hard wear on any form of weighing machine; the scales must be out of truth within two or three days of their use. The only real test on the job was a test of the structure, and that he was dead against, unless they could load to the superimposed load for which the structure was designed; and he hoped that when the L.C.C. regulations came into force that some of the work which would be subjected to a test of 1½ would collapse (without loss of life), because in his opinion it was asking for trouble, and weakened the structure. He was glad to hear that Mr. Bylander did not agree with the 4 by 4 cube for testing. It was not sufficiently large for testing with the aggregate they were using, namely, ¾ in. The reason he advocated a 6 cube was that it was not better made and was more of a shape which was adopted in work generally, and with a circular column they were all the time tending to get a very much batter and consolidated mixture than they did with the square one, because in the former they could ram so much better than with the latter, and with the square one they could not get artificial results. With a 6 by 6 by 12 a double quantity of material would be required, and on a big job the cost of material submitted for testing was quite considerable. He did not think a 6 by 6 by 12 would serve any further purpose than a 6 cube. The former was apt to bind the material for perhaps one hundredth part of a second longer than the latter, which was quite large enough to give them results which they could

not reasonably expect to get in a job. Mr. Bylander had asked why he limited the strength of steel to 72,000 lb. His answer was that if they got it above that there would be a tendency to increase the carbon. If they increased the strength of steel beyond 72,000 lb. there was a tendency eventually to increase the safe load. It was impossible, he thought, to increase the basis of 60,000, and it gave the rolling mills a range of 12,000 lb., which was ample. If they allowed them a greater range than that it opened up the possibility of makers using a foreign loom, whereas with British steel they had a better chance of getting evenness of the metal. Their Chairman had spoken of the financial point of view, and he, the speaker, could assure them that reinforced concrete would never have been used in England by industrial firms if the financial question had not entered into it to a very large extent. Flat roofs were infinitely cheaper and floors of reasonable span could always be done cheaper in reinforced concrete than in steel or wood. Ordinary ship sheds were cheaper, and the whole matter was a question of proper design. A beam 18 in. by 18 in. was probably the most uneconomical section one could have in reinforced concrete. A 9 by 20 or 9 by 24 would probably give the same strength with much less material, and the 2 in. of metal mentioned did not seem very excessive. Architects' supervision was a very big point. Reinforced concrete was work which should be done properly or not at all. He personally never employed a clerk of works, but sent out trained assistants who superintended the work with the help of an inspector. By such means they got infinitely better results; their clients paid their assistants and inspectors while on the job, and it got over all the difficulties of supervision. After all, an architect was only responsible for reasonable care and attention, and he had never seen a job where the architect had given reasonable care and attention come to any harm.

ARCHITECTURAL SOCIETIES.

Nottingham Architectural Society.

Through the kind invitation of Mr. Arthur Marshall, A.R.I.B.A., the members of the Architectural Society had the opportunity on March 14 of inspecting the New Eye Infirmary on the Ropewalk, Nottingham.

The premises have cost nearly 10,000*l*. The irregular site upon which the Infirmary stands, with a fall of 18 ft., presented considerable difficulties in planning, but these have been most satisfactorily overcome. The large out-patient department is entered on the lower level from Oxford-street. A stepless entrance leads into the waiting-hall, which is capable of accommodating about 100, and is fitted with specially-designed oak seats. A little marble fountain is built in the wall at one end. Two doors lead directly from this hall into the large consulting-room, an apartment equipped with dark-rooms, microscopic-room, and a dispensary, by which the patients pass out after examination or treatment.

The service entrance is also approached from Oxford-street, where a special yard is provided for the delivery of coals, food supply, laundry, etc., and where the general business requirements of the Institution are attended to. The kitchen, scullery, larders, meat-store, etc., are adjacent to the service entrance. The former is a model of equipment in cooking for a considerable number, gas being used. A food lift commences in the servery, and communicates with each floor. The committee-room is on this floor also.

The whole of the Ropewalk level is taken up by in-patients and casualty departments. It is divided into male and female sections, each having two wards for eight and six beds respectively. The main entrance opens into a wainscoted hall, which is fitted with seats and the requirements of a small casualty-room, for here minor accidents to the eye are attended to. The two female wards which open out of this are capable of being sectionally darkened by a system of blinds and shutters, features to which very careful consideration has been given. The colouring of the wards, and the glass, which is green, are such as will prove most restful and quiet to the eyes.

A central corridor leads direct to the male wards, and midway between, on the north side, are the operating, sterilising, and clinical rooms. The walls of the former are black.

The dayrooms are designed to be utilised as open-air balconies; by a system of patent sliding windows the whole room can in a few seconds be converted into a sun balcony. Each ward is fitted with a glow-light for night use on a new system, by means of which one switch only is used for giving a light of varying degrees of strength from the faintest glow to the full strength. The roofs, which are flat and covered with Val de Travers asphalt, are utilised as airing-courts for males and females, and shelters are provided for each.

The whole of the staff is accommodated on the floor above the wards. There are a servery or kitchen, nurses' dining and sitting room, matron's sitting-room, and nurses' and servants' bedrooms, each with their separate bathrooms, lavatories, and conveniences. This floor is so constructed that, in the event of an extension of accommodation being required, an additional story may be built without interfering with the working of the Institution.

The entire structure is fireproof, the floors and roofs all being of reinforced concrete. Each ward has its own sanitary annexe and fire-escape staircase. All soil pipes are lined with glass, and all drains are in cast-iron with porcelain lining. No earthenware pipes are used. A boiler in the basement supplies 176 gallons of water per hour at 160° Fahr. The building is heated with low-pressure hot water by radiators of a special hospital pattern devised by the architect.

The entire work has been carried out under the personal supervision of the architect, Mr. Arthur Marshall, A.R.I.B.A.

At the conclusion of the visit Mr. Sutton, Vice-President, conveyed the thanks of those present to Mr. Marshall for so kindly taking them round.

Northern Architectural Association.

The annual general meeting of the Northern Architectural Association was held at the offices in Higham-place, Newcastle, recently, Mr. H. C. Charlewood, F.R.I.B.A., President, occupying the chair.

In their report the Council expressed regret that the depression in the building and allied trades continues. The membership was 224 as compared with 233 last year, the decrease being chiefly in the class of Associates. Mr. F. W. Rich and Mr. J. Oswald had been appointed to attend meetings of the Sub-Committees of the Corporation formed for the purposes of Part II. of the House and Town Planning Act. The Council recorded with regret that it had not been possible to arrange for the exhibition of the designs and drawings in connexion with the Royal Institute competitions in March, as usual. Arrangements had, however, been made to hold the exhibition during the week commencing June 10. The Council had made representations to the Royal Institute suggesting that the appointments of clerks of works should in future be made by the architects.

Prizes had been awarded as follows:—Measured drawings (age limit, twenty-five), Mr. W. Holden; (age limit, twenty-one), Mr. H. St. J. Harrison; architectural sketches (age limit, twenty-five), Mr. S. W. Milburn; (age limit, twenty-one), Mr. H. St. J. Harrison: Glover studentship, Mr. A. E. Lowes; design for a pavilion to be erected in an Italian garden in England, Mr. M. K. Glass and Mr. K. Glover. Some of the drawings submitted were well worthy of reproduction.

The General Fund opened with a balance of 29*l*. 7s. 9d. and closed with a balance in hand of 53*l*. 1s. 9d.

On the motion of Mr. G. T. Brown, F.R.I.B.A., the report and accounts were adopted as eminently satisfactory.

Prizes were presented to successful students by the President.

The following nominations for officers and Council have been received for the ensuing session, and the gentlemen named will be declared duly elected to the respective offices for which they have been nominated:—President, Mr. Wm. Milburn; Vice-President, Mr. R. Burns Dick; Hon. Treasurer, Mr. J. T. Cackett; Hon. Secretary, Mr. C. S. Errington; Hon. Librarian, Mr. J. Bruce, Assistant Hon. Secretary, Mr. C. I. Greenhow; Council: Mr. G. T. Brown, Mr. H. C. Charlewood, Mr. F. E. Dotchin, Mr. W. T. Jones, Mr. J. Oswald, Mr. A. B. Plummer, Mr. F. W. Rich, Mr. A. K. Tasker, Mr. J. W. Taylor, Mr. C. Walker, Mr. W. H. Wood, Mr. S. Ash, Mr. M. G. Martinson, Mr. H. A. Wilson, Mr. J. Hall, Hon. Local Secretary for Sunderland; Mr. J. H. Morton, Hon. Local Secretary for South Shields; Mr. W. J. Moscrop, Hon. Local Secretary for Darlington.

The new President (Mr. William Milburn) having been installed, spoke in acknowledgment, saying that if he handed the chair of office to his successor with the Association in the same healthy condition as it was at the close of the second term of Mr. Charlewood's service he should be delighted. He moved a vote of thanks to Mr. Charlewood for his devoted work.

Mr. R. Burns Dick (Vice-President) also spoke, and the thanks were heartily accorded to the retired President.

The Hon. Secretary (Mr. C. S. Errington) was also complimented upon his work and thanked.

Birmingham Architectural Society.

In connexion with the Birmingham Architectural Association, Mr. Lawrence Weaver lecture on the 21st inst. on "The Development of the Renaissance in Scotland." Mr. C. Bateman presided. Mr. Weaver pointed out that, although most learned works had been written on the baronial buildings of Scotland, no attention had been given to the later work that coincided in date and general treatment with that of Sir Christopher Wren and his followers in England. It was notable that the first impact of the reborn classical taste reached Scotland direct from France, whereas England owed it to an Italian first, and later to Germans and Flemings. At Falkland Palace and Stirling Castle the first evidences of the new manner were to be seen. Sir William Bruce, the architect of the additions made to Holyrood Palace in 1671, was to be regarded as the Scottish Wren, though he fell far behind Wren in personal genius. Still, he was the man who established the full Palladian manner in Scotland, and he was ably followed by William Adam, the father of the famous Brothers Adam.

Leicester Architectural Students.

On Tuesday evening, March 26, Mr. S. Perkins Pick, F.R.I.B.A., gave his ninth annual criticism of the works executed during the session by the students attending the classes in architecture and building construction.

The classes have been conducted on "the principle that construction is the basis of architecture, and its correlative principle that architecture is the interpretation of construction into forms of æsthetic value."

Mr. Pick adjudicated the drawings submitted for the David M. Nesbit prizes, value 10*l*. Mr. Nesbit, a former student, was also present, and made an encouraging speech to the students.

On the proposition of Mr. Fletcher votes of thanks were accorded to Mr. Pick and to Mr. Nesbit.

Architectural Association of Ireland.

A general meeting of this Society was held on the 19th inst., at eight o'clock, in the Lecture Hall, 15, South Frederick-lane. The President, Mr. Page L. Dickenson, M.R.I.A.I., occupied the chair.

The minutes of the last general meeting having been read and signed, Professor C. H. Reilly, M.A., of the Liverpool University, read a paper on "The Monumental Qualities in Architecture," which was illustrated by numerous lantern slides of the principal buildings of ancient Greece and Rome, and also of many modern buildings in America. Professor Reilly made a strong point of the absolute necessity of taking a broad view of all architectural problems, and attributed the success and beauty of the Dublin Custom House to the cultured and broad outlook on life which Gandon, the architect of this building, possessed. During the course of his paper Professor Reilly defined the monumental quality in architecture as composed of four constituents, viz., unity, mass, scale, and refinement; this definition was shown to be very comprehensive by illustrations of Roman and Greek buildings of monumental character which possessed

these four qualities. At the conclusion of Professor Reilly's paper a vote of thanks was proposed by Mr. Albert E. Murray, President of the Royal Institute of the Architects of Ireland, seconded by Professor W. A. Scott, M.R.I.A.I., and supported by Mr. R. M. Butler, M.R.I.A.I., Mr. R. O'Brien Smyth, M.R.I.A.I., and Mr. Connor O'Brien, M.R.I.A.I.

The Guild of Architects' Assistants: Scale of Salaries.

From the Annual Report of the Guild of Architects' Assistants, one of the objects of which is to secure a recognised scale of salaries for Architects' Assistants, we take the following, adopted by the Council on December 17, 1911 :—

"One hundred cases, gathered from London and the provinces, of conditions of the employment of Architects' Assistants have been examined by us, and from them we arrive at the following facts :—

1. The present average salary

		s. d.	
At the ages of 19 to 21 is		21 0	per week.
,, ,, 21 ,, 25 ,,		31 0	,, ,,
,, ,, 25 ,, 30 ,,		49 3	,, ,,
,, ,, 30 ,, 40 ,,		61 8	,, ,,
,, ,, 40 and over		65 0	,, ,,

2. We find no difference between assistants possessing examination qualifications and those without them. This position is corroborated by the statement of Professor Reginald Blomfield in his notes on the recent changes in the R.I.B.A. examinations :—"In the opinion of many competent authorities, the standard hitherto reached in the R.I.B.A. Examinations has been lower than it should have been."

3. Age and experience are uniformly inseparable, their averages being constant. In addition, the definition of "experience" involves the difficulty of distinguishing between the experience of a pupil and that of a scholar from a technical institution.

4. We therefore adopt age as the sole standard, other conditions as to personal character and work remaining equal.

5. Exceptional men and exceptional work will always find exceptional markets, and therefore are absolutely excluded from our consideration, dealing as we do with the normal, unexceptional assistant.

6. We desire to record our strenuous opposition to the existence of unpaid assistants, other than duly articled pupils.

7. The scale of minimum salaries for a week of thirty-nine working hours which we propose is as follows :—

	Age.	Salary.
Improvers ..	19 to 21.....	25s. per week.
Assistants ..	21 ,, 25.....	35s. ,, ,,
,, ...	25 ,, 30.....	50s. ,, ,,
,, ...	30 ,, 40	65s. ,, ,,
,, ...	40 and over ..	70s. ,, ,,

Deduced, as these salaries are, from current rates, we regard assistants below twenty-five years of age to be excessively badly paid at present, and some of the minimum salaries throughout are remarkably low. We regard 35s. as a necessary minimum for the age of twenty-one in comparison with the wage paid in almost any trade. In conclusion, none of these proposed figures are in any way absurd or chimerical; they are paid by many principals, and we are actuated only by the desire to bring the current rates of assistants' salaries to those paid by the average conscientious practitioner."

GENERAL NEWS.

Good Friday Week.

In consequence of the Easter Holidays, we go to press a day earlier than usual next week, the *Builder* being published on Thursday. All communications must reach the Editor by first post on Wednesday morning.

Professional Announcements.

The address of Mr. Percy J. Westwood, A.R.I.B.A., is now 7, Adam-street, Adelphi, W.C. His telephone number will remain the same—1217 City.

Mr. Sydney Jeffree, F.S.I., has changed his address to 27, Chancery-lane (17, Lower Ground Floor).

Mr. Alfred Cox, F.R.I.B.A., has removed his offices from 4, Adam-street, Adelphi, W.C., to 34, Henrietta-street, Covent Garden.

Messrs. Gale, Durlacher, & Emmett, architects and surveyors, have removed their offices from No. 33, New Bridge-street, Ludgate-circus, to No. 15, New Bridge-street (opposite). Their telephone number will in future be City 6888, and telegraphic address, "Galdono, London," as hitherto.

King Edward Memorials.

At a meeting of the executive committee of the King Edward Memorial Fund on March 7 at the Mansion House, under the presidency of Sir Vezey Strong, the Chairman, it was announced that the fund now amounts to about 68,000*l*., and that, 20,000*l*. being allocated to the statue in Green Park, a sum of 48,000*l*. is available towards the cost of the proposed Shadwell riverside park, for which a further sum of 5,000*l*. is offered by the Reginald Poulter Trust: it is suggested that an acre be added to the site by taking in the foreshore to low-water mark.

The Theosophical Society's New Buildings.

For the erection of the Society's buildings, at an estimated cost of about 40,000*l*., after designs prepared by Mr. E. L. Lutyens, on the site near the north-eastern corner of Tavistock-square, a lease for 200 years has been granted by the Duke of Bedford of the land which abutted, eastwards, upon the west side of Burton-street, by Tavistock House. The St. Pancras Borough Council have resolved to support the Society's application to the magistrates for a closing of the *culs-de-sac* in both directions, which have hitherto existed by reason of the garden ground between Burton-street and Upper Woburn-place, Tavistock-square.

New Government Buildings.

The offices of the Crown Agent for the Colonies, at present situated in Whitehall-gardens, will be removed eventually to a new building. The site virtually decided upon, subject to the approval of the Secretary of State for the Colonies, is in Millbank, near the offices of the Ecclesiastical Commissioners. Mr. J. W. Simpson, F.R.I.B.A., is preparing plans.

Art Museums and Picture Galleries.

Mr. Edwin T. Hall will read a paper on "Art Museums and Picture Galleries" at the general meeting of the R.I.B.A. fixed for April 1. The illustrations will include a fine collection of slides specially prepared for the paper. Mr. Hall's paper is in substitution of that on "Modern Methods of Construction," which Mr. Dunn is unable to read

Charing Cross Tube Station.

The Playgoers' Club has just removed from Clement's Inn into the premises erected over the station, where they will occupy the upper three floors. The dining-room, lounge, and reading-room are on the fourth floor; on the fifth floor are the billiard-room, card-room, and Secretary's office, and above are the kitchen and Steward's quarters. A reference and lending library and theatrical museum will be shortly opened.

Jewish Memorial to King Edward VII.

The memorial to King Edward VII. in Mile End-road, opposite the London Hospital, was unveiled on March 14. The fountain, designed by Mr. W. S. Frith, embodies a stone column carrying a bronze figure of Peace, with bronze groups of Liberty and Justice, and a medallion portrait of the King. The memorial has been erected at a cost of more than 800*l*., subscribed by all classes of the Jewish community.

New Telephone Exchanges, London.

Three new telephone exchanges will shortly be provided in London. They will be opened in Clerkenwell, to relieve the London-wall and Central exchanges; in Tottenham Court-road, to be known as the Museum Exchange, in relief of the Gerrard, Central, and Mayfair exchanges; and at Notting Hill-gate, to be known as the Park Exchange, in relief of the Mayfair and Western exchanges.

International Gas Exhibition, Amsterdam.

An exhibition of applications, instruments, and appliances using gas for lighting, heating, industrial, and scientifical purposes will be held on September 14 to October 6 in the Paleis voor Volksvlijt, Amsterdam. The manager of the municipal gasworks will organise the Exhibition; the address of the Committee of Management is 29A, Amstel, Amsterdam.

Statue of Bacon for Gray's Inn.

Mr. F. W. Pomeroy, A.R.A., is the sculptor of the bronze statue of Sir Francis Bacon that will be set up in June in South-square, Gray's Inn. The design embodies a Renaissance pedestal, 6 ft. high, supporting a figure of the Chancellor in his robes and holding the Great Seal, in its case, the costume being in accordance with that of the seated effigy in St. Michael's at St. Albans and portraits preserved in the Inn.

French School of Archæology in Athens.

M. Homolle, member of the Institute of France, has been appointed a Director of the French School of Archæology, at Athens, for a term of six years, *vice* M. Hokleau, resigned. M. Homolle thus resumes a position he formerly occupied until he was appointed Director of the Louvre.

The Church Building Society.

The Incorporated Church Building Society held its usual monthly meeting on the 21st inst. at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz., building new churches at South Norton, St. Michael and All Angels, Co. Durham, 100*l*.; Dawdon, St. Hilda and St. Helen, Co. Durham, 185*l*.; Goodmayes, St. Paul, Essex, 120*l*.; and Goole, St. Paul, Yorks, 125*l*.; rebuilding the Church of St. George, Leicester, 150*l*.; and towards enlarging or otherwise improving the accommodation in the churches at Charlestown, St. Thomas, near Halifax, 20*l*.; Norbury, St. Stephen, Surrey, 50*l*.; Rye Harbour, The Holy Spirit, Sussex, 50*l*.; and Walton-on-the-Hill, St. Mary, Lancs, 120*l*. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Manningham, St. Luke, near Bradford, 50*l*.; and Ynismeudw, St. Mary, Glam, 50*l*. The following grants were also paid for works completed :—Westcliff-on-Sea, St. Saviour, Essex, 100*l*.; South Wimbledon, St. Peter, Surrey, 150*l*.; Grangetown, St. Aidan, near Sunderland, 100*l*.; Pembrey, St. Illtyd, Carmarthenshire, 80*l*.; Holmer, St. Mary, near Hereford, 25*l*.; and Caergeiliog, St. David, near Holyhead, 40*l*. In addition to this the sum of 320*l*. was paid towards the repairs of thirty-one churches from Trust Funds held by the Society.

Civil Service Estimates: Public Works and Buildings.

Class I. of the Estimates, for public works and buildings, shows that for the current year 3,638,080*l*. will be required, being a net increase of 171,384*l*., as compared with the amount, 3,466,696*l*., for 1911-2. There are items of 71,300*l*. (a decrease of 4,400*l*.) for the Royal Palaces; 50,800*l*. (a decrease of 3,370*l*.) for the Parliament Buildings; 125,700*l*. (a decrease of 7,833*l*.) for Royal parks and pleasure gardens; and 215,300*l*. (an increase of 75,300*l*.) for Labour Exchange and Insurance buildings. Up to the end of last year 41,649*l*. was expended upon the hire of Labour Exchange buildings, and 9,537*l*. was spent upon purchase of premises.

The Old Chapter Library, St. George's Chapel, Windsor.

In the course of some alterations of the interior of the office of the Chapter Clerk, which was originally part of the library of the Dean and Canons in the Dean's Cloisters, have just been discovered the panel-work of the ceiling, which at one time formed the canopy of the entire library. The panels, of oak, have bosses delicately carved. The central boss, in form of a chalice upon an altar, bears the letters "T. B.," which, it is supposed, are the initials of Thomas Brode, who was Canon and Treasurer of St. George's Chapel in 1490-3. The Chapter records evince that the building was begun in 1483. Other bosses present cognisances of the Royal House of York, one consisting of the sun shining in glory at the back of a shield charged with a pierced heart and surrounded with a crown of thorns. Embedded in the wall, to the north-east, has been found a window with oaken framework of ten lights.

Duke of York's School Buildings, Chelsea.

At an outlay of nearly 30,000*l*., the buildings vacated by the Duke of York's School have been adapted for the Headquarters of the County of London Territorial Association, and will so provide for a force of 5,000 men. The top floor

of the main building is reconstructed to afford eighteen complete and self-contained quarters for the permanent staff; on the second floor are the offices of the Association; the London Irish are quartered on the first floor, and the Army Service Corps are on the ground floor. There are two riding schools, stabling for thirty horses, six rifle ranges, a large restaurant, recreation-rooms, swimming-bath, etc. Each regiment has its own messing quarters and canteen. The medical units will be housed in the left wing, which is now being remodelled for their use.

Street Improvements, Hendon, N.W.

Major J. Stewart, R.E., one of the Inspectors of the Local Government Board, held an inquiry on the 26th inst. at the Urban District Council offices into the Council's application to construct kerbing, channelling, and paving works in Golder's Green-road, etc., from the London County Council boundary at Hampstead to Hendon. Mr. S. Slater Grimley, M.Inst.C.E., the Council's Engineer, gave evidence in support, and stated that the distance covered by the proposed improvement was about two miles, his estimate being 10,835*l*. The proposed expenditure was primarily due to the large building developments which have taken place in the district, particularly since the opening of the Golder's Green Station of the Hampstead Tube Railway. The latter railway is about to be extended to old Hendon, and then, no doubt, this picturesque suburb of London will grow even more rapidly, the want of railway facilities with London being greatly felt in the past.

The Late Mr. G. E. Pritchett, F.S.A.

In the course of next June will be sold by auction the collection formed by the late Mr. G. E. Pritchett, of Oak Hall, Bishop's Stortford, architect. The collection includes oak panelling, old Spanish leatherwork, prints, engravings, etc., and examples of Jacobean, William and Mary, Queen Anne, and Chippendale furniture. An obituary notice of Mr. Pritchett appeared in our issue of March 8.

Bombay and the Durbar.

The Government of India have agreed to contribute one-fourth, and the Bombay Government will subscribe 20,000*l*., towards the estimated cost, 800,000 rupees (53,333*l*.), of carrying out in white marble the designs, after the Saracenic manner, of the temporary pavilion which was erected on the Apollo Bunder, Bombay, for the landing of King George V. upon the occasion of his recent visit to India. The King, it is stated, has expressed a wish that his entry into India, and the previous Royal associations of the Apollo Bunder, should be commemorated with a building worthy to symbolise the Gate of India.

CORRESPONDENCE.

Practical Patriotism.

SIR,—The unparalleled confusion in industry brought about by the coal strike leads us to point out two pieces of practical patriotism which, if generally followed at once and for the immediate future, would do much to mitigate the after effects of this disaster. As a firm employing thousands of men, we view with anxiety the inability of railway companies to transport our stone and granite products from the quarries—many of them inland—to their destinations. All railway companies have issued notices involving the total cessation of such traffic till the conclusion of the strike. This places us at a disadvantage with foreign competitors, who, in foreign vessels with foreign coal, can ship to a British port giving the shortest possible land journey to site, and can supply materials for the completion of contracts for which, through no fault of our own, our materials are not at present available.

As this difficulty is shared, we believe, by a large number of British firms supplying all sorts of building and engineering materials, we venture to urge on all architects, surveyors, engineers, and builders that, as far as possible, except in the case of absolutely necessarily urgent work, an agreement be made to waive the time clauses of contracts, as far as is reasonably possible, in order to preserve as much work as possible for British firms and British workmen when the crisis is over.

The abnormal conditions also warrant us in urging that, during the period of depression which must follow the present crisis, the Government departments, also public bodies, such as municipal corporations, as well as architects, surveyors, and engineers, stipulate that, so far as possible, British materials only be used in work under their control until normal trade is again obtained. A system of voluntary patriotic action of this nature is sure to find favour at the present time among responsible persons of every shade of political thought, and we therefore venture to make these two suggestions.

UNITED STONE FIRMS, LTD.
(WALTER BRYANT, General Manager).

The East Sussex Hospital Competition.

The following letter has been addressed to the Chairman and members of the East Sussex Hospital Committee, Hastings, by Mr. William Henman, from whom we have received a copy:—

GENTLEMEN,—Trusting that past experience with the existing hospital would compel every precaution being taken to secure a design which would meet modern hospital requirements in a practical and sanitary manner, I ventured to apply experience, gained during the last thirty years, in the design and construction of a number of provincial hospitals, to solving the somewhat intricate problem of planning a hospital to detailed requirements on a difficult site.

Realising that others capable as myself would be competing, I was prepared to accept the decision which presumably was acquiesced in by your assessor, until I had the opportunity to-day of examining the selected plans published in the *Builder*. So faulty are they in so many and important particulars that, in the interests of the undertaking, I respectfully submit it would be advisable, before instructions are given for carrying them into execution, that the following questions should receive most careful consideration:—

1. Did not the conditions properly limit the height of pavilions to two stories?

2. Are the gradients of roadway to the casualty and in-patients' entrance and to the main entrance to administration building practicable?

3. Is it a satisfactory arrangement to have the casualty department and in-patients' receiving-room so far from the out-patients' department? In provincial hospitals new patients frequently mistake one for the other, and it is not an unusual occurrence for some to wait for hours in the wrong place without receiving attention, when one department is away from the other.

4. Are the casualty and in-patients' receiving-rooms arranged so that patients on ambulance waggons or stretchers can conveniently be received or transferred to the wards?

5. How could a patient be conveniently conveyed on ambulance, trolley, or stretcher from the out-patients' department to the wards? Such occasionally becomes necessary.

6. Where are baths, lavatories, and water-closets, sinks, etc., for the two eye wards, and for the four and two bed, surgical and medical, male and female wards?

7. Where is bath accommodation for gynæcological ward?

8. Where is bath accommodation for two isolation wards?

9. How can patients on ambulance trolleys or stretchers be conveyed into the two and four bed wards?

10. Is it advisable that staircases should give air communication between the two and three stories of main pavilions?

11. Where are the cleaners' and trolley rooms to any of the five floors of wards?

12. What is the practical utility in providing external stairways for escape in case of emergency if it is impossible to convey patients in beds or on stretchers to and down same?

13. How is the out-patients' department to be economically supplied with hot water and heating with the boilers at a considerably higher level?

14. How can foul linen from the wards, etc., be conveniently conveyed to the disinfector and thence to the laundry? Or even to the laundry direct from the wards, except past kitchen and store-rooms?

15. Is it convenient when medicines are required for the wards from the dispensary that they should have to be conveyed up a stairway and a considerable distance along a corridor to the lift, and then, for most of the wards, again along a corridor?

16. Is it a sanitary arrangement that foul water from the operating department should have to be discharged into the small areas, three stories deep, near the kitchen department, and thence to be conveyed under the buildings?

17. How can foul water and rain water, as well as snow occasionally, otherwise be removed from these small areas, the depth of three stories?

18. Is it desirable that house coal should be shot down in a narrow passage close to kitchen entrance off an enclosed yard, too small in which to turn a cart round?

19. Is the provision for getting in coal for boilers practicable?

20. Is it good to shut out sunlight by wide balconies at ends of wards and to have the sides of wards overshadowed by projecting sanitary turrets?

21. Is it advisable that tradesmen and stores should enter close to the mortuary and out-patients' department?

22. Is the isolation block conveniently placed for supplying meals? How would patients be conveyed there? And how would they be visited by medical men, particularly in the event of the additional pavilion being erected?

23. Will the ophthalmic surgeon consider it a convenient arrangement that he will have to traverse 250 ft. of corridor to get from three male to three female patients?

24. How is a corpse to be conveniently transferred from a ward to the mortuary?

25. Is the requirement reasonably fulfilled that the hospital should be designed so that portions can be erected as funds permit?

The foregoing questions imply serious faults in planning which appear in the selected design, not one of which, I can confidently state, is to be found in the design I had the honour of submitting, and I doubt if many other designs so flagrantly disregard undoubted essentials in hospital planning.

Whatever may be the result of investigation on the above points, I trust it may, at least, prevent heavy expenditure on faulty lines.

WILLIAM HENMAN, F.R.I.B.A.

Stafford and Portland Competitions.

SIR,—We learn that the competition now advertised at Portland is for Council offices, to cost 4,000*l*. This is the same figure for which the Stafford Library is to be erected. Are we to see again a scramble of 200 men for 200*l*.? Are competitions such as these likely to enhance the dignity of the profession?

We understand the President of the Institute is to be asked to appoint an assessor, and to confer his official sanction on this exploitation of the profession.

Cannot some limitation, either by district or otherwise, be insisted on? Open competitions such as these not only result in monetary loss to the profession as a whole many times more than the fees accruing, but serve to lower the value of architects' services in the eyes of the public, and so the loss is unqualified. D.

Combined Heating and Power Plant.

SIR,—We think your correspondent Mr. S. Whitmore Robinson must have been misled by your summary of Professor R. J. Durley's paper on the combined centralised heating and electrical installation at the McGill University, Montreal, Canada.

Had he heard the paper read he would have understood that no reflection was intended on English architects and engineers, but that it was simply a description of the system as applied to the institute in question.

An application of the system was installed by ourselves at the Camberwell Infirmary, London, under the instructions and supervision of Mr. Edwin T. Hall, F.R.I.B.A.

For DARGUE, GRIFFITHS, & CO., LTD.,
J. ALFRED DARGUE.

INTERCOMMUNICATION COLUMN.

Plaster Painted Dado.

SIR,—Could you tell me which is the correct way to lay off a plain plaster painted dado on staircase 2 ft. 4 in. high, whether up and down or long way? W. J. SHARP.

BOOKS RECEIVED.

THE WORKS OF MAN. By Lisle March Phillips. (London: Duckworth & Co. 7s. 6d. net.)

HOUSING AND TOWN PLANNING CONFERENCE, 1911. (London: E. & F. N. Spon, Ltd. 10s. 6d. net.)

EDITORIAL SUMMARY.

"A Lesson from America" is the title of the leading article, in which reference is made to the recent Architectural Association discussion on the subject.

An article on the King Edward Memorial appears on p. 350.

In "Notes" columns (p. 351) will be found comments on: "Forest Fire Prevention"; "Ancient Villages in Lake Gatun"; "The Building and Cost of Manchester Schools"; "The Newest Responsibility of Architects"; "Up-to-Date Bruges."

Some art exhibitions are noticed on p. 352.

A meeting of the Architectural Association was held on Monday, when Mr. C. A. Voysey and Mr. Arthur Keen read papers on "Patriotism in Architecture" (p. 352).

The Ninth Carpenters' Hall lecture on the "Arts Connected with Building" was delivered on Wednesday last week by Mr. W. R. Hoare, whose subject was "The Craft of the Brick and Tile Maker" (p. 356).

A report of the International Smoke Abatement Exhibition is given on p. 357.

On p. 359 we give the second part of the paper by Mr. Alban H. Scott, on the "Testing of Materials Used in Reinforced Concrete," read before the Society of Architects, together with some notes on the discussion which followed.

Our reports of "Architectural Societies" (p. 361) include: "Northern Architectural Association"; "Architectural Association of Ireland"; "The Guild of Architects' Assistants"; "Nottingham Architectural Society."

In Correspondence columns (p. 363) will be found letters on: "Stafford and Portland Competitions"; "Practical Patriotism"; "The East Sussex Hospital Competition."

A report of the fifth spring visit of the Architectural Association, to the new buildings of King's College Hospital, Denmark Hill, is given on this page.

An illustrated article on the work of Mr. Arnold Mitchell is given on p. 365 under the heading of "Contemporary Architects and their Work."

The Building Trade Section (p. 370) includes: "The Right to Work"; "The Institute of Builders"; "The Institute of British Decorators"; "The Builders' Clerks' Benevolent Institution"; "Projected New Buildings in the Provinces"; "Applications under the London Building Acts," etc.

A third article on the "London Opera House," with illustrations, is given on p. 374.

An illustrated article on "Reinforced Concrete in Great Britain" is given on p. 375.

MEETINGS.

FRIDAY, MARCH 29.

Glasgow Architectural Craftsmen's Society (The Technical College).—Business meeting. 7.45 p.m.

SATURDAY, MARCH 30.

The Royal Institution.—Professor Sir. J. J. Thomson, M.A., LL.D., D.Sc., F.R.S., on "Molecular Physics"—VI. 3 p.m.

MONDAY, APRIL 1.

Royal Institute of British Architects.—Mr. Edwin T. Hall on "Art Museums and Public Galleries." 8 p.m.
The Society of Engineers.—Mr. Gerald O. Case on "Ligno-Concrete." 7.30 p.m.
Royal Society of Arts.—Mr. Noel Heaton, B.Sc., F.C.S., on "Materials and Methods of Decorative Painting"—III. 8 p.m.
Liverpool Architectural Society.—Annual general meeting. 6 p.m.

TUESDAY, APRIL 2.

Institution of Civil Engineers.—Paper on "The Works for the Supply of Water to the City of Birmingham from Mid-Wales," by Messrs. L. Mansergh and W. L. Mansergh, MM.Inst.C.E. 8 p.m.

WEDNESDAY, APRIL 3.

The Institution of Municipal Engineers.—Mr. Sidney Palmer on "The Design and Planning of Working-Class Dwellings." 7 p.m.
Edinburgh Architectural Association.—Associates' meeting. 8 p.m.

THE ARCHITECTURAL ASSOCIATION:

FIFTH SPRING VISIT.

THE new buildings of King's College Hospital at Denmark-hill were visited by the Architectural Association on March 16, precisely two years after the previous visit. In the interval great progress has been made, though much yet remains to be done before the hospital can be opened. The general plan, which has been scarcely varied from the competition scheme, was fully described in the report of that visit, but may be briefly outlined as a main "backbone" corridor running east and west lengthwise of the site, with nine ward pavilions southward of this, overlooking Ruskin Park, and various administrative, educational, and special buildings northward of the same corridor next Bessemer-road; the Outpatients', Casualty, Bathing, and other departments, necessarily within easy reach from outside, occupying the angle nearest to Denmark-hill. An important influence on the formation of the scheme was exerted by the rise of about 15 ft. in the level of the site from north to south, which places the ground floor of the ward pavilions on a level with the first floor of the Administrative buildings. The visit of inspection was chiefly confined to the Administrative Block and Ward Pavilions, which two years ago had only been commenced. The former is now structurally complete. It is six stories in height, the whole of the upper portion above the first floor being devoted to the Nurses' Home and Servants' Department, each self-contained. The building consists of a front block parallel with Bessemer-road, with three wings running southward at right angles, the outer wings accommodating nurses' bedrooms, and the central one servants'; nurses' sitting-rooms are arranged facing the road. Each bedroom is generally similar and contains a built-up wardrobe of the same material as the partitions. All angles are rounded, and a hollow skirting of granolithic is formed at the floor level, slightly raised to finish flush with the floor, which will be of linoleum laid direct on cement. No heating is provided in the rooms, all the necessary radiation being in the corridors, whence it is admitted by opening fanlights, but each room is provided with an extract flue carried up to the top of the building. The present accommodation is for 200 nurses, but the west wing (as yet unbuilt) will extend this to a total of 300. The Nurses' Dining Hall, seating 150, is a fine room on the ground floor, served directly from the main kitchen, which is in the basement between the east and centre wings of the Administrative Block, the various stores being also situated here, readily approached from a sloping roadway for goods delivery.

The public parts of the Administrative Block, comprising offices, boardroom, etc., are well grouped around a charmingly designed central hall, two stories in height, from which groined corridors radiate. In the rear of the Administrative Block, at the intersection of the cross axes of the whole institution, the chapel is in course of construction. This projects between the two central pavilions, approached by a low vaulted cloister, and is a lofty building with aisles separated by reinforced concrete piers or stanchions, which rather curiously change above springers into steel lattice-framed trusses for the vaulted ceiling. Beyond the chapel at a lower level is the central power-station and shaft. Three Lancashire boilers 30 ft. long will be installed, but Diesel oil engines will be used for driving the electric dynamos.

Six ward blocks of the ultimate nine are now in course of construction, with accommodation for 372 beds, the two central pavilions, three stories high, being already in carcase. The remainder will be of only two stories. All are similar in plan and comprise a day-room for patients and a sister's room next the "backbone" corridor, with an octagonal "blow-through" lobby interposed between these rooms and the rest. Next are two single-bed wards, duty-room, larder, linen, and clinic, and the main twenty-four-bed wards, with sun-balconies at their south ends between sanitary towers projected at oblique angles. The wards will contain several novel features in design and construction. Midway in their length a small octagonal bay projecting on each side will contain lavatories for the medical officers' use. The sashes, of a very ingenious yet simple design known as the "Austral," upon the improvement of which a great deal of though has been expended by the architect, will be fixed almost flush with the internal wall face, avoiding window-ledges. Every hospital architect knows the unfortunate complications of heating and other pipes, which tend to disfigure his wards and give rise to objections of a hygienic nature also. Here all pipes are excluded and will rise outside the building in specially-prepared conduits run in the wide window-splays and branching direct to each floor through flues provided.

In the construction ferro-concrete on the Hennebique system has been adopted for floors, stanchions, beams, staircases, and lantern-lights. The floors are filled in between the beams with hollow fireclay tubes, and are sufficiently thick to avoid projecting beams and contain the descending flues from central ward stoves. The building work, by Messrs. Foster & Dicksee, Ltd., appears to be excellent, and the architect, Mr. W. A. Pite, F.R.I.B.A., who kindly arranged and conducted the visit, paid a generous tribute to them, as well as to the clerk of works (Mr. Thomas Simpson) and to his own staff for the excellent help he had received from all. When completed the hospital will evidently be a notable one; the ingenuity with which the complex mechanism of interrelated departments has been brought in contact at various points, while yet preserving an apparent architectural directness of lay-out, and the equal ingenuity with which forms of detail usually abandoned as frankly hopeless have been persuaded into shapeliness, all give cause for congratulation. If a criticism may be made, it is that the site is rather closely covered with buildings—more space would be desirable, but it is understood that neither for this nor for the placing of the Nurses' Home in a position not now generally favoured is the architect really responsible.

COMPETITION NEWS.

Municipal Offices, Bulawayo.

The first prize in connexion with the design for the new municipal offices at Bulawayo, which are to cost 35,000*l.*, has been awarded to Messrs. Gibson & Robertson, of Johannesburg; the second to Messrs Hawke & McKinlay, of Cape Town; and the third to Mr. Stanley G. Hudson, of Durban.—*South Africa.*

ILLUSTRATIONS.

The Work of Mr. Arnold Mitchell.

OUR illustration plates this week are given in connexion with the article, on the next page, on the work of Mr. Arnold Mitchell. The illustrations are referred to in the course of the article.

FIFTY YEARS AGO.

From the *Builder* of March 29, 1862.

The Thames Embankment Bill.

IN moving last week for leave to bring in the Thames Embankment Bill, Mr. Cowper stated that the powers contemplated by the Bill would be committed to the Metropolitan Board, without any control or interference, except that the coal dues were at present in the hands of the Treasury. The Bill would empower the Treasury to pay the money to the Board, who, however, would be left free and unfettered in executing the purposes of the Act. The Bill was described as one for embanking the north side of the River Thames from Westminster Bridge, and for making new streets in and near thereto, and from Blackfriars Bridge to the Mansion House. After some discussion, leave was granted to bring in the Bill.

sun-balconies at
sanitary towers
The wards will
s in design and
heir length a
g on each side
r the medical
a very ingenious
the "Austral,"
ch a great deal
by the architect,
th the internal
-ledges. Every
he unfortunate
d other pipes,
wards and give
nic nature also.
l and will rise
ecially-prepared
ndow-splays and
r through flues

concrete on the
n adopted for
staircases, and
are filled in
v fireclay tubes.
avoid projecting
ding flues from
lding work, by
td., appears to
ct, Mr. W. A.
arranged and
erous tribute to
lerk of works
o his own staff
ceived from all.
will evidently
ity with which
f interrelated
t in contact at
preserving an
ess of lay-out.
which forms of
rankly hopeless
hapeliness, all
If a criticism
the site is
uildings—more
t is understood
e placing of the
t now generally
y responsible.

—

EWS.

awayo.

n with the de-
ffices at Bula-
00*l.*, has been
Robertson, of
Messrs Hawke
and the third
of Durban.—

—

NS.

Mitchell.

this week are
ith the article,
the work of Mr.
he illustrations
e article.

—

AGO.

h 29, 1862.

nt Bill.

ve to bring in
l, Mr. Cowper
plated by the
e Metropolitan
r interference,
at present in
The Bill would
the money to
ld be left free
he purposes of
ribed as one
of the River
idge, and for
r thereto, and
the Mansion
n, leave was

HOUSE IN SURREY: GARDEN FRONT.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W.

HOUSE IN SURREY: GARDEN FRONT.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W

BARNETT HILL: ENTRANCE FRONT.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W

UNIVERSITY COLLEGE SCHOOL, HAMPSTEAD.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Sprague & Co., Ltd. Printers 69 & 70, Dean St. Soho, W

ASCOT PLACE FIRE-PLACE.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

COMBINATION ROOM, CAIUS COLLEGE.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W.

COMBINATION ROOM, CAIUS COLLEGE.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

HOUSE IN SURREY: ENTRANCE HALL.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Sprague & Co., Ltd., Printers, 69 & 70, Dean St., Soho, W.

ASCOT PLACE: ORGAN FRONT.—Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Entrance Front: University College School, Hampstead.
Mr. Arnold Mitchell, F.R.I.B.A., Architect.

CONTEMPORARY ARCHITECTS AND THEIR WORK:

MR. ARNOLD MITCHELL.

MR. ARNOLD MITCHELL, F.R.I.B.A., the subject of our present notice, was born in 1863. His technical training commenced in the office of Messrs. George & Peto, but he was not articled in the ordinary way. He also entered the Royal Academy Schools, being a contemporary of Mr. E. Guy Dawber, and competed for prizes and studentships at the Royal Institute and the Architectural Association. Mr. Mitchell confesses that his scholastic successes were not won at the first attempts or without much hard work, despite his abilities as a draughtsman; but as a winner of the Institute Silver Medal, the Soane Medallion, and the A.A. Medal he can claim a record of which any architect might be proud. At a later stage he acted as clerk of the works for a year, and he also served in the Architect's office of the old London School Board, and acknowledges that the experience he got from these two occupations has been invaluable. At the London School Board he got a thorough grounding in the intricacies of school planning, and school design has formed a considerable part of his practice. In the early years of his practice he collaborated with Mr. Alfred Butler in school competitions, and several of their designs have been illustrated in our pages.

For some years Mr. Mitchell played a considerable part in the doings of the Architectural Association. He was a member of the Council in the year 1902-3, and again in the year 1905-6. In 1903-4 he became one of the Vice-Presidents, during Mr. Henry T. Hare's occupancy of the Presidential chair. The "sweets of office" had perhaps small attraction for him; the large amount of extra work entailed, and possibly the controversial matters inseparable from an official position, together with the insistent claims

Oak Gallery Brackets in Great Hall: University College School, Hampstead.
Mr. Arnold Mitchell, F.R.I.B.A., Architect.

[*Portrait by Reginald Haines.*

Mr. Arnold Mitchell, F.R.I.B.A.

of a large practice, combined to weary him of these honours, which he soon after relinquished without much regret. The country has a strong call for Mr. Mitchell; his acquisition of a fine old country house and the delight of his own fireside—an Adam fireside, with an Adam ceiling above it—proved stronger than the call of late sessions and protracted Council meetings. And to the delights of his home Mr. Mitchell adds the pleasures of a beautiful garden, in the upkeep of which he finds one of his principal recreations.

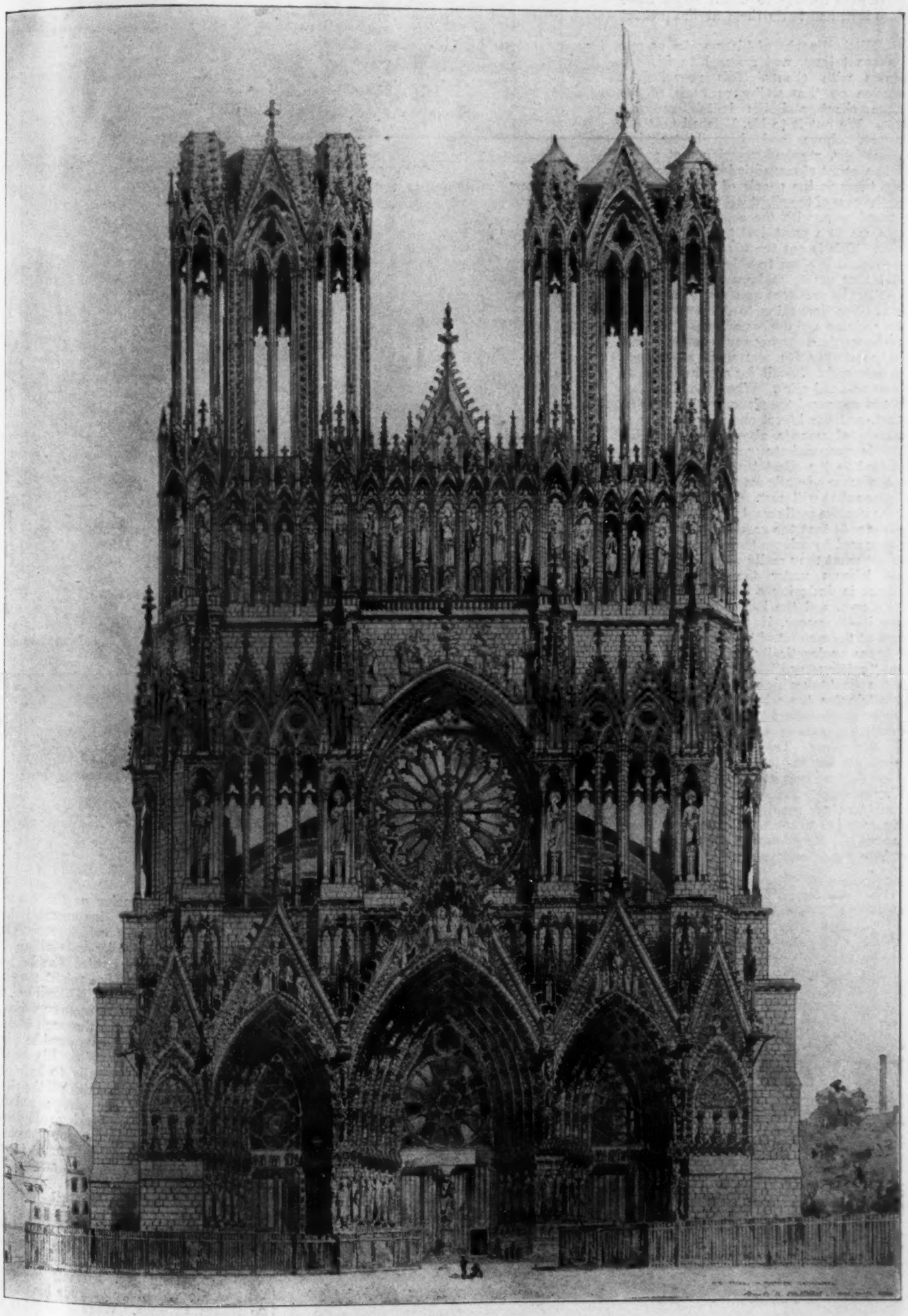
Since that time the London architectural world has—to its loss—seen comparatively little of Mr. Mitchell. He has a distaste for publicity; and thus very little of his work has been published. Indeed, we can only call to mind two of his recent important buildings that have been illustrated—the University College Schools at Hampstead, won in competition, 1905, and the Agricultural Schools at Cambridge University. Mr. Mitchell is, however, the designer of a very large number of houses, many of which are at Harrow, Northwood, Rickmansworth, and the surrounding districts. Drawings of these have been hung at the Royal Academy, where Mr. Mitchell has been a regular exhibitor. One of the works which Mr. Mitchell says gave him much pleasure was the additions and alterations to Tissington Hall, Derbyshire, a fine old stone mansion. A drawing of this appeared our issue for May 18, 1901. Of the buildings illustrated in this issue—mostly domestic—we can give little information, since their author will say little, except that they speak for themselves and are typical examples of his present work. Mr. Mitchell has been accorded Royal patronage, and his design for a Royal Villa and Golf Pavilion at Le Coq-sur-Mer, near Ostend, for the late King of the Belgians, was exhibited in 1903.

Mr. Mitchell is a great believer in the value of sketching to the student. Himself a distinguished draughtsman, he thinks it is unequalled as a training for the hand and eye, and for tuition in composition. But the kind of sketching he advocates would probably be found a severe test of skill by any draughtsman. No rough notes or memory aids to be worked up in the studio afterwards; but straightforward freehand work on the spot. Of his own prowess in this field there are many pages of the *Builder* to testify. Some of Mr. Mitchell's drawings were included in "The Cathedrals of England and Wales" series, among them being Lichfield, west front (January 5, 1889); Peterborough (April 4, 1891); and Durham (June 3, 1893). Among other drawings of Mr. Mitchell's that we have published are the following:—1887: Chalons Cathedral (December 3, 17). 1888: Layer Marney Church, Essex; a corner of Peterborough Cathedral; and Feering Parish Church, Essex (July 21). 1889: The Triangular Bridge, Croyland (January 26); some Marsh-land Churches of Norfolk (August 10); and Senlis Cathedral—south-west Tower (December 21). 1890: Wrexham Church Tower (February 22). 1891: Choir Stalls, Amiens (January 10); XIIth-century Chapel, Houghton-le-Dale, Norfolk (May 3); Sketches at Peterborough (April 11). 1892: More Sketches at Peterborough (April 2). 1893: A.A. Excursion Sketches, Diss, Ipswich, and Bury St. Edmunds (August 19). 1894: A.A. Excursion Sketches, Wells and Glastonbury (August 18). 1895: Sketches in Normandy (January 5). 1901: Examples of Brickwork, Feering Parish Church, Essex (September 21). An examination of these drawings will show not only Mr. Mitchell's catholicity in choice of subject, but his great abilities in draughtsmanship. As a student he was accustomed to go out sketching for hours—sometimes twelve hours at a time in the long summer days—and confesses to often returning home thoroughly fagged-out. A cartridge block and a small T-square he considers essentials for good solid work, and drawing the subject out completely on the spot is not only fine training, but is a great aid to the study of perspective. Working on such lines means, in Mr. Mitchell's own words, "downright art."

Oak Carving in Great Hall: University College School, Hampstead.

Mr. Arnold Mitchell, F.R.I.B.A., Architect.

A fine set of drawings of Layer Marney Towers secured for Mr. Mitchell the R.I.B.A. Second Silver Medal in 1886, and these were published in our issues for April 3 and 10 in that year. Mr. Mitchell's design for a Bank in a Country Town won him the A.A. Medal in 1885. The front is somewhat unusual, and both this and his Soane Medallion drawings are in a modern Renaissance style, showing some of the influence of his Principals, and of the terra-cotta period then flourishing. The Soane



West Front of Rheims Cathedral.

From a drawing by Mr. Arnold Mitchell, F.R.I.B.A.

subject for the year 1885, when Mr. Mitchell won it, was a design for a Municipal Mansion, a building designed for civic entertainments and hospitality, and presumably as an official residence for a mayor. Mr. Mitchell says frankly he would recast these designs if he had to do them at the present day.

Mr. Mitchell spoke of his practice as one on pleasant lines, and referred to friendly relations with clients. This provoked a discussion on that well-worn topic of the average client and his irritability over extras. We put it to Mr. Mitchell that the architect, above and beyond technical qualifications, required unerring tact and a certain amount of magnetic influence to steer safely through the shoals of practice. We cited the case of the client with a definite sum to spend who, with the common failing of clients, wants a great deal too much for his money. This is not the kind of client that Mr. Mitchell is often troubled with; but he agreed that much unpleasantness generally ensues if the architect appears to be in the wrong. The first thing to do is to get the client's wishes and desires and show him the house he wants, deferring any question of cost or responsibility for cost until afterwards. It is extremely difficult for any architect to give an off-hand price. When the client has seen and approved the plans, tenders may be invited, and the lowest one may be tens or hundreds of pounds above the price the client is prepared to spend. It is then explained to the client that the plans show him the house he really wants, and the tender the amount it will cost. Is he prepared to pay for what he really wants? Mr. Mitchell's experience is that the great majority of men are prepared to enlarge their ideas of cost if they get what they really want. But if the client labours under the idea that the architect is designing a building to cost a certain sum, and the lowest estimate is far above it—moreover, if the architect looks aghast at the amount of the tender, murmurs the figure apologetically, and talks vaguely about "cutting down"—it is hardly surprising that the client takes his cue from the architect and attributes the whole difficulty to the latter's shortcomings. In Mr. Mitchell's opinion, the onus of cost must always rest with the client. The architect's function is to obtain for the client what he wants and see that he gets it.

We obtained some views of Mr. Mitchell on matters of practice. He believes in doing your job yourself, and then you know all about it. He advocates roughing out on cartridge paper, and in starting on the ½-in.

The Porch: Barnett Hill.

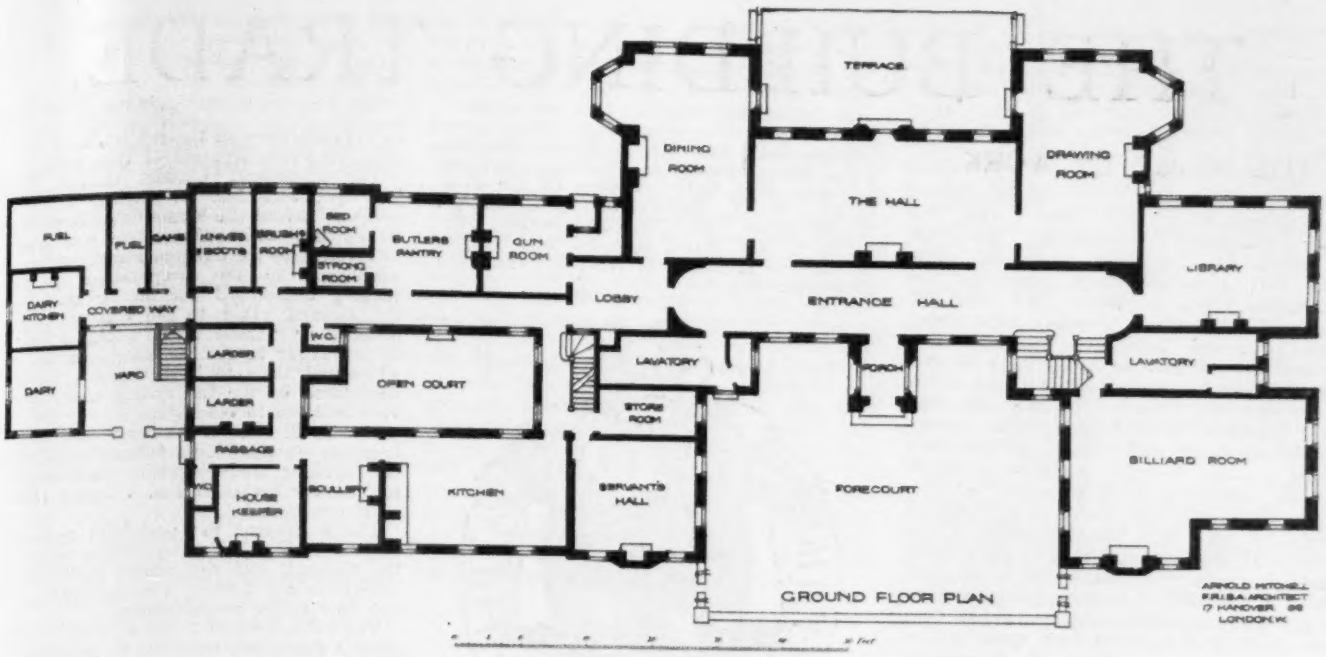
Mr. Arnold Mitchell, F.R.I.B.A., Architect.

Garden Front: Julian Cottage, Harrow.

Mr. Arnold Mitchell, F.R.I.B.A., Architect.

details before commencing on the ⅛th-scale drawings. There are innumerable little points in the details which may affect dimensions in the smaller-scale plans; but with the procedure suggested the ⅛th-scale sheets work out smoothly straight away and require no alteration. Mr. Mitchell will not have "extras." It requires some organisation to avoid them, but by the thorough working out of a job before it is commenced he thinks they can be avoided. With his smaller houses he contrives generally to have only one contract drawing on which all the plans, sections, and details are given; and this makes for simplicity in working. If details are only supplied as the job proceeds, openings for "extras" to come in are multiplied. Builders much prefer this complete working out of the job beforehand; and thus Mr. Mitchell finds his business relations with builders work very smoothly. In fact, he states he has designed eleven houses for builders for their own occupation.

Another maxim Mr. Mitchell enjoins is that you should not worry your brains with two things at once. Work one thing out and finish it, and then start on the other. He has done a good deal of competition work, and believes in getting well ahead with this branch of practice. He showed us a set of



House in Surrey: Ground Plan.

Mr. Arnold Mitchell, F.R.I.B.A., Architect.

drawings to be submitted in a limited competition, completely finished three weeks before sending-in day; and he stated that it was his usual practice to get competition work forward. Mr. Mitchell has many big works in hand at the present time; among them a big office building in the North, of which we saw complete plans, also a number of country houses. In spite of the calls of a large practice, Mr. Mitchell is a firm believer in not worrying. By organising his work on the lines indicated, and by ruling out all the unessentials, he manages, as he himself confesses, to find life very endurable, and to secure much pleasure in the home and garden of which he speaks with so much enthusiasm and affection.

House in Surrey: The Staircase Ceiling.

Mr. Arnold Mitchell, F.R.I.B.A., Architect.

THE BUILDING TRADE.

THE RIGHT TO WORK.

IN recent years the trade unions introduce a Bill known as the Unemployed Workmen Bill, the object of which was to affirm a general principle that every workman possessed the inalienable right to work, and that, if he could not obtain work, employment must be found for him, with the important proviso that he was not to be employed at less than the standard wages ruling in the district. This Bill became known as the "Right to Work" Bill. This expression is somewhat unfortunate, as the trade unions are the very last societies to recognise the inherent right in each man to work as he wills, and they really only recognise a right to work with the permission of the unions. If any man attempts to work without their leave and licence he is at once termed a "blackleg," and the special powers the trade unions obtained in the Trade Disputes Act are brought to bear upon him or his family in the form of "peaceful persuasion."

It is the public who are now beginning to call for a Bill which shall recognise the right to work, and for adequate protection for those who wish to exert that right. The strike in the coal trade, universal as it is, has held up industries in no way connected with the particular dispute, and thousands of workpeople, through the action of one trade federation, have been denied their right to work. Thus the zeal of the trade unions for the principle of the right to work has been proved to be "skin deep," and, in fact, their attitude presents no principle at all. Had the employers in the coal trade resorted to a lock-out universal in its nature on the scale of this strike it can easily be imagined how the trade unions would have characterised such action on their part, and how the principle of the freedom of action would have been invoked. The Chancellor of the Exchequer in the first day's debate on the Minimum Wage Bill indignantly asked, "Can a man be compelled to work?" The answer is, of course, in the negative, but a man can be compelled to allow others to work, and it is for compulsion of this nature that the nation is now calling. A disastrous strike such as that we have been experiencing would never occur in an exceedingly well-paid branch of employment involving no very great special training were the right to work but recognised. Even in the railway strike the companies could have filled the places of the strikers three times over had it not been for the intimidation of the unions concerned. It is now quite clear that it is essential to the welfare of the nation that the right of each individual to ply his avocation on such terms as he may deem fit must be restored and maintained, and that methods of intimidation practised by organised bodies, be they associations of masters or men, are inconsistent with the liberty of a commercial nation, and that the whole country must now assert its freedom and curtail the privileges of such societies, which, after all, but represent a minority, and a small minority, of the population.

LONDON ASSOCIATION OF MASTER STONEMASONS.

THE annual meeting of this Association was held at Cannon-street Hotel, E.C., on March 14, when the following were present:—Mr. Fred Corben (President) in the chair; Mr. C. W. Courtenay, J.P. (Vice-President); Mr. F. J. Barnes, C.C.; Mr. T. Beckley, Mr. J. Bysouth, Mr. W. Bryant, Mr. William Bryant, Mr. E. J. Fox, Mr. E. Grice, Mr. H. J. E. Lucas, Mr. Frank Mortimer, Mr. E. Morris, Mr. W. Pangbourne, Mr. Ernest E. Way, Mr. J. Way, Mr. Walpole Collins, Hon. Secretary and Treasurer.

A cordial vote of thanks was accorded to Mr. Fred Corben for the services rendered by him to the Association during the past year, and Mr. C. W. Courtenay, J.P., was unanimously elected President for the coming year. Mr. Fred Corben, on relinquishing the office of President, becomes ex-President. Mr. Stephen Collins, M.P., and Mr. T. Sturge Cotterell, J.P., were elected Vice-Presidents, and the following were chosen to serve on the Committee:—Mr. T. Beckley, Mr. E. Grice, Mr. F. Mortimer, Mr. W. Pangbourne, Mr. Ernest E. Way, Mr. J. Bysouth. Mr. Walpole Collins was re-elected as Hon. Secretary and Treasurer.

THE INSTITUTE OF BUILDERS.

THE twenty-eighth annual general meeting of the Institute of Builders was held at the offices, Koh-i-noor House, Kingsway, W.C., on the 20th inst.

The minutes of the last annual general meeting were read and confirmed, and the audited accounts of the Institute and of the Institute Benevolent Fund were submitted by the Treasurer (Mr. J. Carmichael, J.P.), and were adopted.

The following officers were elected for the ensuing year:—

President—Mr. H. Arthur Bartlett (Messrs. Perry & Co. (Bow), Ltd.).

Vice-Presidents—Mr. Ernest J. Brown; Mr. F. G. Rice (Messrs. Rice & Son); Mr. E. J. Strange (Tunbridge Wells); Mr. Leonard Horner (Messrs. Ashby & Horner).

Treasurer—Mr. F. L. Dove, London County Council.

To fill vacancies on the *Executive Council*—Mr. A. B. H. Colls (Messrs. Trollope & Colls, Ltd.); Mr. Walter Lawrence, jun. (Messrs. Walter Lawrence & Son); Mr. F. M. May (Messrs. Holland, Hannen, & Cubitts, Ltd.); Mr. James F. Parker (Messrs. Patman & Fotheringham, Ltd.); Mr. E. S. Rider (Messrs. T. Rider & Son); Mr. William Willett.

Hon. Auditors—Mr. Eric M. May (Messrs. Holland, Hannen, & Cubitts, Ltd.); Mr. G. C. Hudson (Messrs. Hudson Brothers).

A hearty vote of thanks was given to Mr. James S. Holliday (Messrs. Holliday & Greenwood, Ltd.) for his services during the past year.

The following report from the Council was approved:—

"The Council, in presenting the Annual Report, regrets that, although the building trade has to a certain extent improved, it still continues to be in a very unsatisfactory condition. For some years past the competition has been particularly acute, and this, coupled with the general unrest in the country and the prospective heavy burdens about to be imposed on employers by the Legislature, render the prospects of a desirable change anything but promising.

Attention has been given to Parliamentary matters affecting the building trade; steps have been taken to try to effect such changes as are desirable in existing Acts, and to judiciously modify Bills of importance before the House of Commons. In these matters the Council has been glad to co-operate with other bodies.

The Council has given much time and care to the formulation of an agreement for sub-contractors who are specified by architects, and to the alterations which this document entails in the agreed form of contract. The proposed form of sub-contractor's agreement was submitted to the National Federation, being one of the signatories of the agreed form, and was practically approved. It was then brought informally before the R.I.B.A. at a Conference on the subject, and it is now under the consideration of that body.

The President, Colonel George Haward Trollope, and Mr. J. Styles, kindly gave evidence before the Home Office Departmental Committee, which Committee was appointed to investigate the dangers attending the use of white-lead in the preparation of paints. Having considered the matter most closely, the Council came to the conclusion, in the interests of the trade, that it would be preferable to endeavour to exclude altogether the use of white-lead than to have exacting regulations introduced by the Legislature which would be very irksome to employers.

Mr. F. G. Rice is the representative of this Institute on the Home Office Committee, and the building trade is under great obligations to him for his close and valuable assistance in the matter.

The movement to re-establish a system of apprenticeship has occupied the attention of the Council, and suggestions have been submitted to the London County Council, which are now under consideration.

The existence and utility of technical schools, proper discipline, payment of premiums, etc., are matters which affect this question and need careful consideration.

Your Council and the Council of the London Master Builders' Association jointly took part in the consideration of suggestions made by the Quantity Surveyors' Association on the question of items to be embodied in all preliminary bills. The results of the Council's comments on the suggestions were forwarded to the Quantity Surveyors' Association in due course, and it is to be hoped that good will be derived in consequence. . . .

Many thanks are due to Mr. Frank May, J.P., Mr. Joseph Randall, Mr. G. Haworth, Mr. A. T. Pollock, and to the India Public Works Department for contributions to the Institute Library.

The following grants were made from the Institute Benevolent Fund:—Builders' Benevolent Fund, 100*l.*; Builders' Clerks' Benevolent Institution, 10*l.* 10s.; Provident Institution of Builders' Foremen and Clerks of Works, 10*l.* 10s.

It is with deep regret we report the death of Mr. Joseph Bell, J.P. (President, 1907-8), and of the retirement of Mr. F. J. Dove. Both these gentlemen have done yeoman service to the Institute and were personally much respected and esteemed by a large number of friends in the trade. . . ."

INCORPORATED INSTITUTE OF BRITISH DECORATORS:

ANNUAL DINNER.

THE annual dinner of this Institute was held on Monday at the "Trocadero," Piccadilly-circus, Mr. J. D. Crace, President, in the chair, supported by Mr. H. Drummond, President Association of Master House Painters in Scotland; Mr. T. N. Richards, President of the National Association for England; Professor Reginald Blomfield, A.R.A., and Messrs. H. D. Searles Wood, J. C. Nicholson, M. C. Cowtan, A. B. Cowtan, W. H. Pitman (Treasurer), W. Stewart-Greene, A. Mackay, E. Graham Simpson, F. Jones, J. W. Garson, W. G. Sutherland, F. Carpenter, J. Sanderson, F. De Jong, H. N. Hornsby, W. N. Bridges, J. R. Chappell, F. G. Dear, A. S. Jennings, P. A. Jones, F. W. Englefield (Secretary), and others.

The loyal toasts having been suitably proposed by the President and honoured,

Mr. W. Hayward Pitman

proposed the toast of "The Incorporated Institute of British Decorators and its President." He said the Institute was incorporated in 1899, but he was sorry to say that in London there had not been that development in regard to membership as they would have liked, and London did not seem to appreciate the work they were doing as much as was the case in the North and in Scotland, where they seemed to appreciate the advantages and benefits of the Institute, for they helped the Institute in every way. The Institute was very much indebted to the Northern and the Scotch branches. The Institute had been able during the last year to revive the Travelling Studentship very much because of the help of the President. Nineteen sets of drawings had been sent in, and as one of the judges he could

say that a better collection of works of art by young people could not have been brought together. The winner of the Travelling Studentship was Miss Dora Bard. It was hoped to continue the Studentship next year and other years. The Institute had been very fortunate in its President, and they had been glad to have him at their head from the beginning of its existence.

The President,

in reply, said he had been President for twelve years, and he began to think that was too long, and that the Institute wanted a new President. The Institute did not exist with the object of supporting trade interests; its *raison d'être* was to encourage and forward the artistic side of decoration. He thought that the artistic use of colour and decoration should be more studied and encouraged. Colour was one of those things which might do much to improve or much to destroy if badly used, and it was not unnatural that clients and architects should look with uneasiness to the approach of the decorator unless they knew what he was capable of, and to that must be partly attributed the uncompromising use of white as a ground. The only case in which we got white in nature was in a snowstorm, and that could not be said to convey the idea of comfort, and even then the chance was that the sky had something of colour in it. We ought to be able to make use of colour, and he rejoiced that they had been able to send a student abroad to study the artistic and beautifully-adapted colour decorations of Italy. In Italy one was surrounded by a great deal that was bad as well as good, but a very little training ought to enable a student to recognise what was worth studying and what should be avoided. The first object of the Institute was to encourage social intercourse among the members and the exchange of ideas. Then the encouragement of the study of decoration as an art was a self-evident object of the Institute, and to assist the coming generation of decorators to qualify themselves for the pursuit of the beautiful was in itself a good and noble object to pursue. The work of the Institute did not include watching over the trade interests of decorators, because that was already admirably done by the National Association of Master Painters, but it was concerned with those objects which made for the honour and welfare and the capacity and efficiency of the decorator of to-day.

The President

subsequently proposed the toast of "The National Association of Master Painters of England and Wales, Scotland and Ireland," and remarked that these Associations had done a great deal for the master painters of the country in many ways. The Associations had brought together men engaged in the same work and had given them an opportunity of discussing their interests together, and had given a wide outlook to the business and calling of painting generally, and had done much for the education of the younger members and apprentices of the trade.

Mr. Richards,

who responded for the National Association of England and Wales, referred to the excellent work being done by youths as the result of the instruction received by the Schools of Art and by other methods.

Mr. Drummond,

who responded for the Association for Scotland, spoke of the excellent work carried on by the Institute, and of the energetic work of Mr. Sibthorpe in connexion with the Association.

Mr. Sutherland also responded.

The President then proposed the toast of "The Guests," coupled with the name of Professor Reginald Blomfield, A.R.A.

Professor Blomfield

said that at one time and another he had taken a great deal of trouble to explain the difference between architecture and decoration, and some of his critics had said that because he had said that decoration was not architecture and architecture not decoration that therefore he did not care about decoration. That was a ridiculous libel, for decoration was one of the primitive instincts of humanity; but, apart from that, it was really the last and, if he might say so, the fine flower of architecture itself. Of course, there was always the awkward question of who was to superintend the work, viz., the decorator or the architect? Years ago an eloquent Frenchman wrote a book on "Primaticcio" to show that the arts could never go right till the painter took charge of the decorative arts. He did not think that was quite right, because, much as he regarded and admired the painter and the decorator, he did not feel that they were the men who ought to control the ship. Besides the painter and decorator there was the sculptor to be considered, and he had to play a very important part in decoration. The only man who stood apart was the architect, in so far as he held an independent position between the arts, and was a man who ought to know where he wanted emphasis and when to call on the decorator to help him—how he wanted his panels treated, etc. The architect was the man who set the time and the tune, though he did not feel that this question of leadership was so important as that they should all pull together. What we all suffer from in this country—and elsewhere, too—was a certain isolation of the arts—the unconscious jealousy of one art to another, and he felt sure they would agree with him that this was quite wrong, and that they should all try to pull together. He believed from what he had heard that the Institute was doing admirable work, and they were fortunate in their President, who held a name well known in the list of English decorators.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE thirty-fourth annual dinner of the Builders' Clerks' Benevolent Institution, was held on Tuesday, March 26, at the King's Hall, Holborn Restaurant, the President, Mr. R. Dudley Bartlett, of Messrs. Perry & Co. (Bow), Ltd., in the chair. About 400 were present.

The Chairman, in proposing the toast of the "Builders' Clerks' Benevolent Institution," said that when he looked down the long list of Past-Presidents of the Institution he saw that it comprised the names of practically all the great men of the building trade. His father occupied that chair some twenty-one years ago, and he was proud to follow in his father's footsteps. He, however, was bound to say it was the first time his father had consented to be overshadowed by one of his sons. He, himself, found that the position of President of that Institution was no sinecure, but necessitated the giving up of a great deal of leisure time. The Institution was founded in 1866, which was forty-six years ago, and its objects were to provide pensions to aged clerks and those who were incapacitated; and also to provide for their widows. It seemed to him that there was a very large number of charitable institutions in the country, and consequently it was necessary to make sure they were supporting the most worthy objects. It was argued, and he thought quite rightly so, that a man who spent his life at his work should have saved enough to keep him in some sort of comfort for the rest of his life. It was the men who were incapacitated or their widows they had to deal with. The Institution had good reason for feeling proud of itself in that respect. Last year they paid 776*l.* to thirty-one pensioners out of an income of 790*l.*; however, the expenses brought the total payments to 870*l.* They were consequently dependent upon the generosity of those present to put them on the right side. The Institution had paid 10,000*l.* in pensions, besides several hundred pounds in temporary relief. They had also given 1,000*l.* to the charitable schools. In these days, when trade was practically as bad as it could be, it seemed to him an extraordinary thing that the merchants and others had come forward and assisted them in such a generous way. He thanked them all for the way they had helped the Institution.

Mr. H. A. Bartlett (President of the Institute of Builders) said the toast he had to propose was that of "The Architects and Surveyors." It was a time-worn and time-honoured toast. He thought, however, that instead of being called architects they should be called the compendium of useful knowledge. It seemed to him that there was not much room in the world for anybody but architects. They fulfilled so many useful positions nowadays—not only were they architects, but they were undoubtedly financiers, diplomatists, and a dozen other things. It very often happened that when a client went to an architect he had decided to have a 5,000*l.* house built, but after seeing the architect and having a quiet chat with him he was firmly of the opinion he could not do with a house of less than 10,000*l.* value. The architect then went to the builder and showed him the plans of a very beautiful house, and expected him to build it for about 2,000*l.* He objected rather to the architects entering the field of building which they seemed to do nowadays. They not only did all the planning, etc., in connexion with their profession, but they practically arranged the whole of the building operations, and consequently the builder would soon cease to exist, or, at any rate, become a mere subcontractor. He sincerely hoped the architects would soon begin to realise that builders could do a little bit of joinery and a little digging without getting an expert to do it. Regarding the surveyors, he looked upon them as being an extraordinary set of men, as they always seemed to satisfy all parties. He coupled with the toast the names of Mr. Chas. Frankiss and Mr. Walter Lawrance.

In reply, Mr. Frankiss said he felt it a privilege to respond after what had been said about them by Mr. Bartlett. He could assure them it had given him great pleasure in hearing of the progress reported by the Chairman. He hoped the Institution would continue to maintain that successful state, and he thanked them for the way they had received the toast.

Mr. Walter Lawrance, F.S.I., who also responded, said he was quite surprised when he saw the report of the Institution in the *Builder* of their wonderful success, especially in these days when they were all struggling to make both ends meet. There had always been a very nice feeling between the architects and the builders' clerks, as they had to look to them for many details of their business, and they were often very difficult points. He was speaking from an experience of over thirty-six years, and he was sure the Institution would receive all their support.

Mr. F. S. Oldham then proposed the toast of "The Builders and Builders' Merchants," and said that he was coupling with the toast two names, one was Mr. Thomas F. Rider, who, as they all knew, was the only gentleman who was President for two years running, viz., in the years 1878-1879.

Mr. Rider, in reply, said he had been connected with the Institution for the last thirty-four years, and he could remember the time when he presided at a meeting of the Institution at which only the members of the Committee were present. He had prepared a very elaborate speech for the occasion, but that was consigned to the waste-paper basket, and the Committee then unanimously proceeded to re-elect themselves. The building trade at the present time could be described as the one which required more trouble to get the work, less profit when that had been done, and after it was the greatest difficulty to get the money. Nowadays it required the wealth of a Crœsus and the patience of a Job.

Mr. Alexander Ritchie, who also responded, said he wished the Institution every success, but he hoped that soon there would not be any need for it. If only the terrible strikes could be done away with it would be a step towards that, as the strikes were the curse of the country.

Mr. John Austin, A.C.I.S. (the Secretary), announced that the total list of donations that evening was 414*l.* 2s. 6d.

GOVERNMENT CONTRACTS.

THE following tenders have been accepted during the past month by the Government Departments named:—*Admiralty, Works Department:* Paving slabs for H.M. Dockyard, Chatham—Patent Victoria Stone Company, Ltd., 11-13, Hamilton House, Bishopsgate-street, E.C.; steelwork for aerial ropeway, Cape of Good Hope—The Butterley Company, Ltd., Butterley, near Alfreton; works service: extensions of gun-mounting shop, H.M. Dockyard, Portsmouth—Messrs. Perry & Co. (Bow), Ltd., 56, Victoria-street, S.W. *War Office:* Works services: additions to gymnasium, Lichfield—Mr. A. Robinson, Woodbine Works, Idle, Bradford; additions and alterations to right wing, Duke of York's headquarters, Chelsea—Messrs. Holliday & Greenwood, Ltd., Loughborough Park Works, Brixton; construction of reservoir, Royal Gunpowder Factory, Waltham Abbey—Mr. J. A. Ewart, 21, Old Queen-street, Westminster; drainage work, Wool Camp, Dorset—Messrs. Jesty & Baker, Castletown, Portland; drill and gymnastic hall, Bordon—Messrs. Thomas & Edge, Anglesea-avenue, Woolwich; improvements to married soldiers' quarters, etc., Guildford—Messrs. W. F. Blay, Ltd., Dartford; improvements to married soldiers' quarters, etc., at Weedon—Mr. W. W. Roberts, High-street, Weedon; installation of electric light, right wing of Duke of York's headquarters, Chelsea—Messrs. W. G. Heath & Co., 35, George-street, Plymouth; plunge baths and field practice ranges, Willsworthy, Devon—Messrs. Woodman & Son, Batholomew-street, Exeter; remodelling and extending military hospital, Fort Pitt, Chatham—Mr. C. E. Skinner, Railway-street, Chatham; supply and

erection of shed for gun drill, etc., Shoeburyness—Messrs. G. Sands & Co., Ltd., Colwick, Nottingham. *India Office, Store Department:* Bridgework—Brandon Bridge-Building Company, Motherwell; bricks—Messrs. J. Grayson, Lowood, & Co., Deepcar, Sheffield; cement—Associated Portland Cement Manufacturers, Portland House, Lloyd's-avenue, E.C. *Crown Agents for the Colonies:* Bridgework—Sir William Arrol & Co., Ltd., 32, Victoria-street, S.W., The Horseley Company, Ltd., Tipton, Staffs; cement—Wouldham Cement Company, Ltd., 35, Great St. Helens, E.C. *Office of Works:* Builders' work; construction of subway at Birmingham Parcel Office—Mr. E. Crowder, Farm-street, Birmingham; demolition of old buildings and erection, East Ham Branch Post Office—Messrs. J. Chessum & Sons, 7A, South-place, E.C.; extension of Hampstead S.O.—Messrs. R. A. Lowe & Co., Chislehurst, Kent; extension, Haverfordwest Post Office—Messrs. W. Bowers & Co., Bath-street, Hereford; extension, Hinckley Post Office—Messrs. Walter Moss & Son, Coalville, near Leicester; adaptation, Liverpool temporary parcel office—Mr. G. L. Desoer, Everton-road, Liverpool; demolition of old buildings and extension of Portsmouth Post Office—Mr. J. Privett, Cottage-grove, Southsea; work in connexion with hydrants, Queen Victoria Memorial—Messrs. John Mowlem & Co., Ltd., Grosvenor Wharf, Westminster, S.W.; erection of kiosk, Primrose-hill, Regent's Park—Messrs. Pasterfield & English, Sunnyhill-road, Streatham, S.W.; repairing and covering reservoirs and constructing cascading arrangement, Windsor Great Park—Messrs. Holloway Brothers (London), Ltd., Belvedere-road, Lambeth, S.E.; drainage: stud house, Hampton Court Park—Messrs. S. Kavanagh & Co., Surbiton-hill, S.W.: Windsor Castle—Messrs. Matthew Hall & Co., 88, Wigmore-street, W.; engineering works: heating apparatus, Birmingham new parcel office—Messrs. Cannon & Hefford, Stanbury-road, Peckham, S.E.; heating, Leeds Head Post Office—Messrs. J. F. Phillips & Son, Ltd., Mark-lane, Leeds; heating, hot water, and fire mains, Royal Courts of Justice—Messrs. Ashwell & Nesbit, Ltd., 12, Great James-street, W.C.; heating, Park (Western) Telephone Exchange—Messrs. Cannon & Hefford, Stanbury-road, Peckham, S.E.; water softening plant, Windsor Castle—Mr. C. J. Haines, "Rogorte," Worple-road, Wimbledon, S.W. *General Post Office:* Laying line of pipes and Sykes ducts, London-Watford, Section II.—Messrs. Bennie & Thompson, 80, Liverpool-road, Warrington; laying line of pipes, Woodford—Messrs. W. & C. French, Buckhurst-hill, Essex. *Metropolitan Police:* Reconstruction of Hammersmith Police-station—Messrs. Adamson & Sons, 129, High-street, Putney. *Commissioners of Public Works, Ireland:* Building works: erecting and furnishing Aille National School, Co. Galway—Mr. Patrick Burke, Turlough, Bellharbour, Co. Clare; erecting and furnishing Carrownaganonagh National School, Co. Donegal—Mr. William Mooney, Milford, Co. Donegal.

LONDON MASTER BUILDERS' ASSOCIATION.

THE Council of the London Master Builders' Association met on the 21st inst., when Mr. James S. Holliday (President) presided.

The Report of the Bricklayers' Conciliation Board meeting, held on the 14th inst., was read, and the Finance Committee's Report was read and approved.

The rate of subscription to the Association for the year 1912 was determined upon.

Certain legal cases were reported and were referred to a special Committee for consideration and report.

The various Committees and representatives on other bodies were chosen.

Matters were considered connected with a petition to the Prime Minister against the Trade Disputes Act (1906). The petition was presented by Mr. Basil Peto, M.P.

Applications for proposed alterations in working rules agreements with the Amalgamated Society of Carpenters and Joiners and Stonemasons were received, together with an application for the formulation of a working rule agreement with the labourers. They were referred to a Special Committee for consideration and report.

Various other trade matters of interest and importance were discussed.

New members of the Association were elected:—

(1) Ordinary member—Messrs. Allen, Fairhead, & Son, Enfield.

(2) Associate member—Messrs. John Daymond & Son, Westminster.

New member nominated:—

(1) Associate member—Messrs. Messers, Ltd.

GENERAL BUILDING NEWS.

CHURCH, HOVE.

This church has been erected at a cost of 6,000*l.* from the designs of Mr. E. Proctor, architect, of London. The contract was carried out by Messrs. W. A. Field & Cox, builders, of Brighton.

ENGLISH CHURCH, VERSAILLES.

The foundation-stone was laid on March 15, by Dr. Bury, Bishop for Northern and Central Europe, of the new English church at Versailles, which replaces the church which was built fifty years ago, and was destroyed by fire on January 29, 1911. The architect is M. Vye-Parminter, of Paris, whose designs are after the Gothic style. The ground on which the church is being built is of a certain historical interest. An English church or place of meeting existed on this site as far back as during the reign of the Roi Soleil, Louis XIV., but was abandoned after the Edit de Nantes, when the English residents left Versailles. The building was then used by the military authorities as a bakehouse, and later on became the property of Admiral Touchard, whose family graciously returned the property to the resident chaplain of Versailles some fifty years ago. A small church was built, and the ground and building transferred to the Colonial and Continental Church Society, which is now undertaking the building of the new church. The style will be Gothic, simple in form, but of good effect. The chaplain, Rev. Vivian Evans, is obtaining the stained glass windows from Munich, and the pulpit is being carved by the "Christ" who takes part in the Passion Play at Ober-Ammergau.

CO-OPERATIVE BUILDINGS, WHEATLEY HILL.

These new premises for the Sherburn Hill Co-operative Society have been erected at a cost of about 6,000*l.* The architect for the work was Mr. J. W. Taylor, of Newcastle, and Mr. J. Morris, of Felling, was the contractor.

COAL AND SHIPPING EXCHANGE, CARDIFF.

The central hall of this exchange has been renovated from the designs prepared by Mr. Edwin Seward, architect, and the sculpture work has been executed by Mr. Tom A. Jones.

PAVILION, NEWQUAY.

Messrs. Cowell & Cowell, of Newquay, are the architects for this pavilion, which is being erected at the lower end of Harbour-crescent at the corner of Beach-road. The auditorium is to have a sloping floor, but a second floor will be provided for dances, etc., and will hold 800 people. Round the auditorium a raised promenade is to be erected to seat an additional 700 people. There will also be a promenade outside facing the sea. The builder is Mr. G. Miners, of Penzance.

NEW BUILDINGS IN LONDON.

Extensive rebuilding, Waterloo-place, S.W.; Messrs. Higgs & Hill, builders, South Lambeth, S.E. Extensions to United Service Club, Pall Mall, S.W.; Mr. F. G. Winter, builder, Putney, S.W.

TRADE NEWS.

Under the direction of Messrs. Yeates & Jones, architects, Worcester, the "Boyle" system of ventilation (natural), embracing Boyle's latest patent "air-pump" ventilators and air inlets, has been applied to Redhill School, Worcester.

The Wycliffe Memorial Church and Schools, Preston, are being supplied with Shorland's patent exhaust roof ventilators, by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

APPLICATIONS UNDER LONDON BUILDING ACTS, 1894 to 1909.

AT Tuesday's meeting of the London County Council the following applications under the London Building Acts were dealt with. (The names of the applicants are given in parentheses):—

Lines of Frontage and Projections.

Dulwich.—Erection of six houses upon a site on the western side of St. Aidan's-road, Peckham, and fronting upon Peckham Rye (Mr. A. J. C. Ewen for Mr. J. H. Coxon).—Refused.

Hackney, Central.—Addition to Devonshire hall, abutting upon the western side of Frampton Park-road, northward of Devonshire-road, Hackney (Mr. C. G. C. Payne for Mr. H. Goldstein).—Consent.

Hackney, Central.—Erection of a building on the western side of Chatham-place, Hackney, to abut also upon the southern side of Belsham-street (Messrs. Rowlandson & Co.).—Consent.

Hampstead.—Retention of a shop front erected under the projecting landing at No. 150, Finchley-road, Hampstead (Messrs. C. Saunders & Son).—Consent.

Kensington, South.—Erection of a shop front, door head, and cornice at Nos. 3 and 5, Church-street, Kensington, without the erection of corbels in front of the party walls (Messrs. Simpson & Annett).—Consent.

Lewisham.—Erection of houses on the western side of Mayow-road, Sydenham, southward of the Sydenham recreation ground (Edmondsons, Ltd.).—Consent.

Lewisham.—Erection of porches to ten houses on the western side of Perry-rise, Lewisham (Mr. G. H. Payne for the Perry-rise Land Company).—Consent.

Marylebone, East.—Projecting balconies in front of Nos. 379 and 381, Euston-road, St. Marylebone, at the first, second, and third floor levels (Mr. F. M. Elgood for Mr. J. A. Michell).—Consent.

Marylebone, West.—Projecting balcony in front of No. 92, Gloucester-place, St. Marylebone (Mr. F. White).—Consent.

St. George, Hanover-square.†—Illuminated sign erected upon a builder's platform in front of No. 289, Vauxhall Bridge-road, Westminster (Mr. J. Carmichael for Messrs. Parnell & Son).—Consent.

St. George, Hanover-square.—Refacing of No. 33, Grosvenor-street, Grosvenor-square, and the erection of a porch and balconies (Mr. C. Ansell).—Consent.

Strand.—Projecting illuminated sign at No. 53, Strand (Mr. J. J. Bye).—Consent.

Walworth.—Iron and glass shelter at the entrance to a cinematograph theatre on the site of Nos. 42 and 44, Old Kent-road, Walworth (Messrs. Z. King & Son for Mr. E. M. Barker).—Refused.

Wandsworth.—Erection of buildings on the south-eastern side of New Park-road, Wandsworth (Messrs. H. F. Buchan & Co.).—Refused.

Woolwich.—Erection of bay-windows to four houses on the southern side of Glenlyon-road, Eltham Park (Mr. J. J. Bassett for Lord Rowallan).—Consent.

Width of Way.

Bethnal Green, North-East.—Erection of a building to abut upon the southern side of Green-street, the western side of Baker-street, and the northern side of Digby-walk, Bethnal Green (Mr. F. E. Harris for Mr. H. H. Bartlett).—Consent.

Kensington, North.—Erection of an addition at the rear of No. 139, Portobello-road, Kensington, at less than the prescribed distance from the centre of the roadway of Vernon-mews (Mr. S. Newcombe for Mr. J. Smith).—Consent.

Rotherhithe.—Erection of buildings on both sides of Rotherhithe-street, Bermondsey, between Gillham's-court and West-lane (Mr. H. D. Searles Wood for Mr. R. Hyde).—Consent.

Walworth.—Erection of a building on the southern side of Westmoreland-road, Walworth (Mr. W. Wadman for Messrs. G. Carter & Sons).—Consent.

Width of Way and Lines of Frontage.

Limehouse.—Erection of a building to abut upon the north-eastern side of Parnham-street and the south-eastern side of Tomlin-terrace, Limehouse (Mr. H. Riches for Mr. J. Lusty).—Consent.

Paddington, North.—Erection of a building on the northern side of Woodchester-street, Paddington (Messrs. Beazley & Burrows for the Managers of St. Mary Magdalene School).—Refused.

Line of Frontage and Construction.

Lewisham.—One-story shop of a temporary character between Nos. 296 and 300, High-street, Lewisham (Mr. G. Court).—Consent.

Paddington, South.—Erection of a covered way in the basement area at No. 94, Lancaster-gate, Bayswater-road, Paddington (Messrs. W. T. Lord & Co.).—Consent.

Strand.—Retention of two showcases at No. 27, Shaftesbury-avenue (Messrs Pollard & Co. for Mr. H. Goodman).—Refused.

Wandsworth.—Retention of the showcase in front of No. 79, Streatham High-road, Wandsworth (Mr. G. Rogers).—Consent.

Width of Way, Line of Frontage, and Construction.

Poplar.—Motor-car shed of a temporary character on the eastern side of Finch-court, High-street, Poplar (Mr. H. Heckford for the Poplar Metropolitan Borough Council).—Consent.

Space at Rear.

Bethnal Green, North-East.—Re-erection of "The Camel" beerhouse, Globe-road, Bethnal Green (Messrs. W. Bradford & Sons for Messrs. Taylor, Walker, & Co., Ltd.).—Consent.

Space at Rear and Alteration of Buildings.

Deptford.—Alterations at No. 9, Knott-street, Deptford (Mr. A. Roberts for Mr. G. Catt).—Consent.

Cubical Extent.

Chelsea.—Additional cubical extent in respect of a proposed warehouse building upon a site abutting upon Pavilion-road, Charlotte-street, and Cross-street, Chelsea (Mr. C. W. Stephens for Harrod's Stores, Ltd.).—Consent.

City of London.—Erection of a printing office and factory building to abut upon Shoe-lane and Plumtree-court, City (Messrs. J. W. Beaumont & Son for Messrs. E. Hulton & Co., Ltd.).—Consent.

Kensington, South.—Conversion of the second floors of blocks 3, 4, and 5, at the premises of Harrod's Stores, Ltd., fronting upon Brompton-road, from residential flats to trade premises, and erection of additions on the second, third, and fourth floors of a division at the rear of block 2 (Mr. C. W. Stephens for Harrod's Stores, Ltd.).—Consent.

Uniting of Buildings.

Bermondsey.—Uniting of Nos. 96 and 98, 100 and 102, 104 and 106, 108 and 110, and 112 and 114, Tanner-street, Bermondsey, by openings at the first and second floor levels (United Kingdom Temperance and General Provident Institution).—Consent.

City of London.—Uniting of Nos. 3 and 4, New Union-street, Moorfields, by means of an opening at the basement level (Messrs. W. G. Larke & Sons for Messrs. L. Farmer & Sons).—Consent.

City of London.—Formation of a further opening between Nos. 30 and 31, Bouverie-street, City, at the ground-floor level (Messrs. G. Trollope & Sons and Colls & Sons, Ltd., for *News of the World*, Ltd.).—Consent.

Finsbury, East.—Formation of an opening between Nos. 65 and 67, Banner-street, St. Luke, at the second-floor level (Mr. C. Watkins for the City and Westminster Properties, Ltd.).—Consent.

Fulham.—Openings between Nos. 869 and 871, and between Nos. 873 and 875, Fulham-road, Fulham, at the basement, ground, and first floor levels (Mr. A. Dawkins).—Consent.

Islington, South.—Uniting of Nos. 361-3, and Nos. 365-9, City-road, Islington (Mr. F. M. Phillips).—Consent.

Strand.—Uniting of Nos. 38 and 39, Chandos-street, and No. 30, St. Martin's-lane (Mr. C. W. Oatley for Messrs. J. Lyons & Co., Ltd.).—Consent.

Westminster.—Uniting of Nos. 56 and 58, Victoria-street, Westminster, by means of a corridor at the third-floor level (Messrs. Perry & Co. (Bow), Ltd.).—Consent.

The recommendation marked † is contrary to the views of the Metropolitan Borough Council concerned.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

ALDERSHOT.—Extensions to factory, Station-road, for Messrs. Allen & Lloyd.

Ayr.—Diphtheria block; Mr. J. Young, Surveyor, Burgh-buildings, Ayr.

Ballymoney.—Housing scheme; Messrs. J. & J. Smith, architects, care of the Surveyor, Town Hall, Ballymoney.

Barrow-in-Furness.—Public baths (3,000*l.*); Mr. A. Race, Surveyor, Town Hall, Barrow.

Bedford.—Factory adjoining London and North-Western Railway for Messrs. Peek, Frean, & Co., biscuit manufacturers, Drummond-road, S.E.

Benfieldside.—Hospital; Mr. J. Eltringham, architect, Blackshill, Co. Durham.

Berwick. — Parochial buildings (2,300*l.*): Messrs. Harrison & Ash, architects, Newcastle-on-Tyne; Messrs. Gray & Sons, builders, 25A, Eastern-lane, Berwick.

Birkenhead.—Flour mill, West Float, for Messrs. J. Rank, Ltd., Hull.

Birmingham.—Atlas Insurance Offices, Colmore-row; Mr. W. Bishop, builder, King's Heath, Birmingham. Theatre, Dudley-street; Mr. C. H. Robinson, architect, Cherry-street, Birmingham.

Bishopwearmouth.—Church hall, site of Low-row Mission; Messrs. W. & T. R. Milburn, architects, 20, Fawcett-street, Sunderland.

Blackburn.—Extensions and alterations to Town Hall (32,475*l.*); Messrs. W. J. Woof, Cronshaw, & Sons, builders, care of Mr. W. Stubbs, Engineer, Town Hall, Blackburn.

Bournville.—Mission chapel; Mr. A. T. Dunn, architect, Waterloo-street, Birmingham.

Bradford.—Bank, Westgate, for the Bradford and District Bank, Ltd.; Mr. W. Carby Hall, architect, Prudential-buildings, Park-row, Leeds.

Bridgend (Glam.).—Council offices and fire-station; Mr. W. F. Tudor, Surveyor, Town Hall, Bridgend.

Burghclere (Hants).—School; Mr. J. W. Taylor, architect, The Castle, Winchester.

Canterbury.—Laundry (2,000*l.*); Mr. J. Plummer, Clerk, Guardians' Offices, Canterbury.

Castle Dykes.—School; Messrs. Scorer & Gamble, architects, Bank-chambers, Lincoln.

Chelmsford.—Proposed county buildings, Duke-street; Mr. F. Whitmore, County Architect, Chelmsford.

Clarkston.—Proposed police-station (900*l.*); Mr. Hugh Inglis, Surveyor, Town Hall, Airdrie, N.B.

Cluny.—School; Mr. G. Gray, architect, Inverurie, N.B.

Conisborough (near Doncaster).—Extensions to isolation hospital (5,000*l.*); Mr. H. M. Marshall, Clerk, Doncaster and Mexborough Joint Isolation Hospital Board.

Coventry. — Proposed public abattoir (20,000*l.*); Mr. J. E. Swindlehurst, Surveyor, Town Hall, Coventry.

Crickhowell.—Conservative club, near Town Hall; Mr. J. V. Richards, architect, Crickhowell.

Croydon.—School (14,495*l.*); Messrs. W. Smith & Son, builders, London-road, Croydon.

Cwm.—Fifty houses (6,375*l.*); Messrs. J. Marles & Son, builders, care of Mr. Marcus Hoskins, Estate Agent, Town Hall, Swansea.

Dellingburn.—Offices (1,200*l.*); Mr. J. A. Robertson, electrical engineer, Burgh-buildings, Greenock.

Doncaster.—Conversion of premises, High-street, into bank for the National and Provincial Bank Company; Mr. C. H. Brodie, architect, 15, Bishopsgate, E.C.; Messrs. H. Arnold & Sons, builders, Printing Office-street, Doncaster.

Dumbarton.—Swimming-baths (10,000*l.*); Mr. M. C. Denny, architect, 17, High-street, Dumbarton.

Dundee.—School (1,910*l.*); Messrs. Spiers, Ltd., builders, Glasgow.

Eastbourne.—Picture theatre, St. Aubyn's-road; Mr. A. Ford, architect, Gildredge-road, Eastbourne.

Exeter.—Additions to Royal Deaf School (2,900*l.*); Mr. J. Jerman, architect, 1, Bedford-circus, Exeter.

Gillingham (Kent).—Offices at Electricity Works (900*l.*); Mr. H. E. Phillips, builder, Livingstone-road, Gillingham. Mineral water factory, Napier-road, for Messrs. White & Son; Mr. J. J. Freeland, architect.

Glasgow.—Washhouse (5,200*l.*); Mr. A. B. M'Donald, Surveyor, Town Hall, Glasgow. Alterations and additions to buildings, Lochburn-road, for Glasgow Magdalene Institution.

Gravesend.—Church, Pelham-road South; Vicar, Wycliffe Church, Gravesend.

Grays.—School (2,735*l.*); Messrs. Brown Brothers, builders, Grays.

Halifax.—Works, Skircoat New-road, for the Trinity Garage Company, Ltd.

Harrogate.—Additions to pump-room, etc.; Mr. F. Bagshawe, Surveyor, Town Hall, Harrogate.

Holmfirth.—Warehouse, etc., Ford Mill, for Messrs. Wood & Burtt.

Ightham.—School; Mr. W. H. Robinson, Caxton House, Westminster, S.W.

Invercowie.—Additions to premises for Messrs. James Jack & Sons, Ltd., net manufacturers.

Kidderminster.—Extensions to Pike Mills for Messrs. Watson Brothers.

Kirkintilloch.—Proposed parish church; the Heritors, Parish Church, Kirkintilloch.

Leeds. — Clubhouse (2,500*l.*); Secretary, Moortown Golf Club, Leeds.

Letchworth.—Proposed public hall corner of Eastcheap and Town-square; Secretary, Howard Hall Association.

Lonend.—Additions to mills for Messrs. Smith Brothers & Co., shawl manufacturers.

Lowestoft.—The following plans have been passed:—Six houses and shop, London-road South and Kendal-road, for Messrs. Woolnough Brothers; four houses, Carlton, for Mr. F. W. King; bottling store and warehouse, Harvey-street, for Mr. H. G. Lawrence; four houses, London-road South, for Mr. W. Beaumont.

Lye (near Stourbridge).—Theatre; Mr. J. Shaw, architect, 39, Newhall-street, Birmingham.

Macclesfield.—Receiving wards; Mr. Bradburn, architect, Macclesfield.

Maesteg. — Bank, Talbot-street, for the London and Provincial Bank.

Monaghan.—Twenty-four houses (4,315*l.*); Mr. J. Hanna, builder, Terenure.

Newmarket.—Technical institute (1,035*l.*); Mr. H. J. Linzell, builder, Newmarket.

Nottingham.—Proposed rehousing scheme (140,000*l.*); Mr. F. B. Lewis, Architect, Town Hall, Nottingham.

Penrhwtyn.—Infirmary (21,600*l.*); Mr. Evan Thomas, builder, Seven Sisters.

Ramsgate.—Concert hall; Mr. A. D. Sackett, builder, Broad-street, Ramsgate.

Raunds.—Extensions to factory, Park-road, for Messrs. Neal & Gates.

Reigate.—School; Messrs. T. R. & V. Hooper, architects, Market Hall-chambers, Redhill.

Ripley.—School; Mr. G. Widdows, architects, St. Mary's-gate, Derby.

Rochdale.—Extensions to infirmary (18,000*l.*); Mr. H. Healey, architect, of Messrs. Horsall & Healey, Rochdale.

Rochester.—Garage and workshops, High-street, St. Nicholas, for Messrs. Robins & Day.

Royton.—Cotton mill, for the Park and Sandy-lane Mill Company.

Rugby.—Drill hall (3,000*l.*); Mr. T. Willard, architect, Market-place, Rugby.

Scallsceugh.—Farm buildings, etc.; Mr. J. Matindale, architect, Castle-street, Carlisle.

Sheffield.—The following plans have been passed:—Twenty houses, Clarence-road, for Mr. H. E. Fern; additions and alterations, Salutation Inn and White Hart Inn, St. Philip's-road; Franklin Hotel, Franklin-street; Lord Nelson Inn, Arundel-street, for Messrs. W. Stones, Ltd.; alterations and additions, "Swan with Two Necks" public-house, Eyre-street, and Fore Tavern, Mill-sands, for Messrs. T. Berry & Co., Ltd.; four houses, Murray-road, for Mr. A. J. Belton; extensions to foundry, Newhall-road, for Messrs. Cammell, Laird, & Co., Ltd. Extensions, Town Hall; Mr. F. E. P. Edwards, Architect, Town Hall, Sheffield.

Southampton.—The following plans have been passed:—Four houses, Ampthill-road, for Messrs. Weston & Burnett; cinematograph theatre, house, and shop, Shirley-road, for Messrs. Jurd & Sanders; additions, South Hants Waterworks Offices, Shirley-road, for Mr. H. Cawte.

South Ockenden.—School (2,800*l.*); Messrs. Burtwell, builders, Romford, Essex.

Spennymoor.—Town Hall (15,000*l.*); Mr. G. T. Wellburn, architect, Middlesbrough.

Stoke-on-Trent. — Extensions to hospital (3,626*l.*); Messrs. Bennett Brothers, builders, Newcastle-street, Burslem.

Stretford.—Plans have been passed as follows:—Forty houses, etc., Derbyshire-lane, for Mr. John Maunders; extensions to power-station, Trafford Park, for the Trafford Power and Light Supply, Ltd.; school, Montague House, for the Royal Schools for Deaf and Dumb.

Swansea. — Y.M.C.A. headquarters, St. Helen's-road (11,500*l.*); Messrs. Lloyd Brothers, Argyle-yard, Oystermouth-road, Swansea.

Tamworth.—School (6,145*l.*); Mr. Ernest Dent, builder, Aldergate, Tamworth.

Torquay.—Medical baths, etc.; Mr. Taylor, architect, care of Mr. H. A. Garrett, Engineer, Town Hall, Torquay. Plans have been passed for a garage in Teignmouth-road for the Torquay-Chelston Steam Car Company.

Vaenor.—School (960*l.*); Mr. J. J. Meredith, builder, Llanidloes.

Wakefield. — Enlargement of infirmary; Messrs. Simpson & Firth, architects, South-gate, Wakefield.

Walker.—Buildings, etc. (40,000*l.*), near Mitchell and Foster streets, for Sir W. W. Armstrong, Whitworth, & Co.

Wednesbury.—Baths and Town Hall extensions; Mr. E. M. Scott, Surveyor, Town Hall, Wednesbury.

Whalley (Lancaster).—Asylum (359,500*l.*): Messrs. Parkinsons, Ltd., builders, Kent-road, Blackpool.

Willington Quay.—Additions to works for Messrs. Hood, Haggie, & Son, rope manufacturers.

Woodhouse.—Mining institute; Mr. J. Hutchings, County Architect, Stafford.

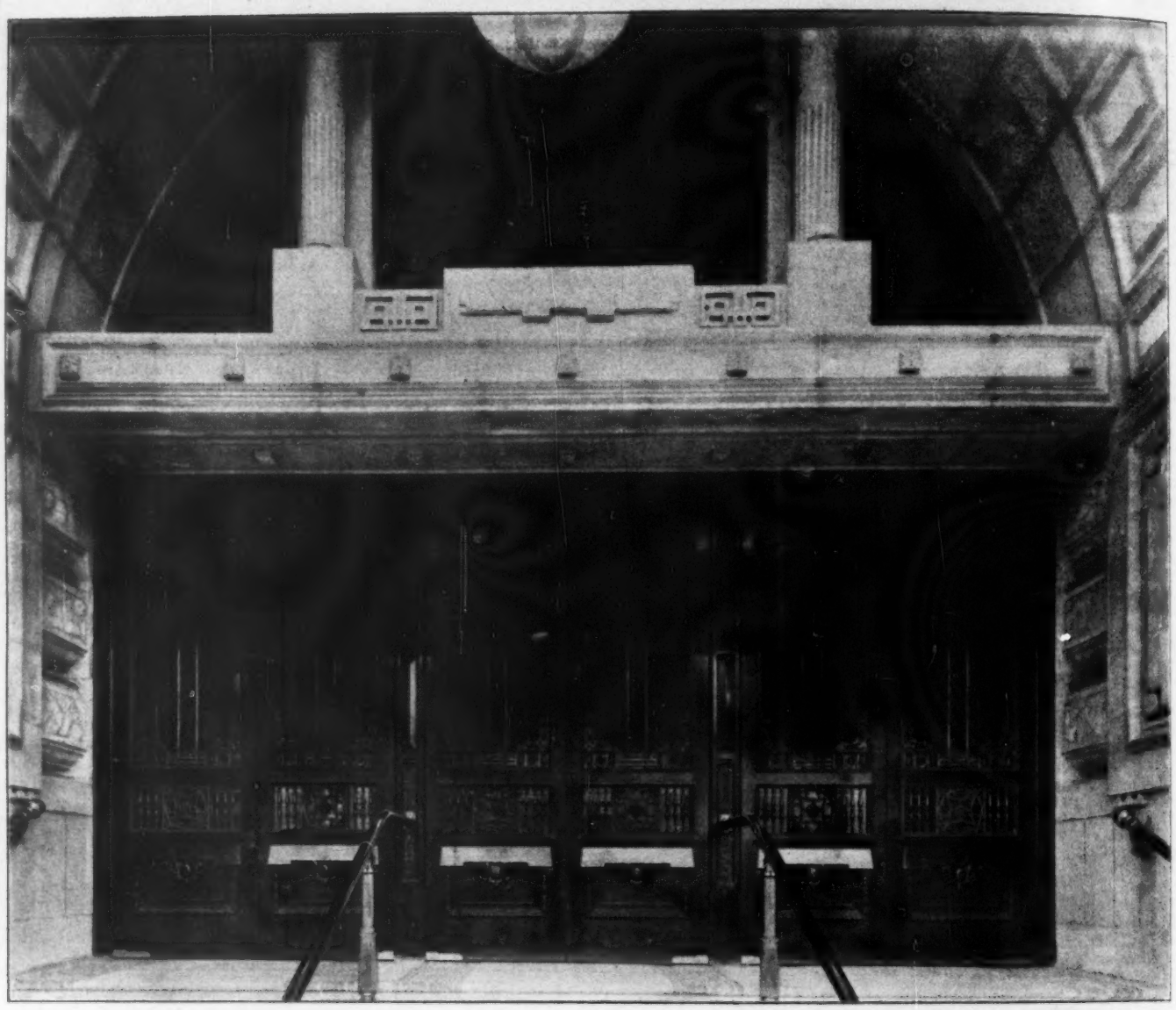
Wyke.—Buildings for Messrs. Roby & Edgar, worsted spinners, Wyke Mill.

Ystradowen.—School; Mr. V. Morgan, architect, Spelman-street, Carmarthen.

* See also our list of Competitions, Contracts, etc., on another page

PICKETS AND TRADE DISPUTES.

It is stated that on behalf of members of the London Master Builders' Association a petition has been presented to the Prime Minister praying for legislation limiting the number of pickets during trade disputes to two.



The London Opera House: Cast-Bronze Grillage to Entrance Door.

THE LONDON OPERA HOUSE.—III.

Electrical Installation.

THE electrical equipment of the Opera House was installed by Messrs. Malcolm & Allan, Ltd., of Kingsway House, W.C., under the direction of the consulting electrical engineer, Mr. F. J. Humphrey, of 39, Charing Cross-road, the interior fittings having been specially design by Messrs. Veritys, Ltd.

Current is supplied by the Charing Cross, West End, and City Electricity Supply Company and the Metropolitan Electric Supply Company. In each case the supply is in the form of continuous current at 200-volts pressure.

The Charing Cross Company furnish current to the main stage switchboard for stage and part of the general lighting, and to one of two other switchboards at the front of the house.

The Metropolitan Company supply current to switchboards on the stage for power, heating, and special effects, to the dressing-rooms switchboard, and to the second switchboard at the front of the house.

For lighting purposes the three-wire system has been adopted, giving a potential difference of 100 volts between the outer conductors and the middle wire, while the power and heating circuits are on the two-wire system at 200-volts pressure.

The main switchboard for the stage, on the "prompt" side, is at some height above the floor, and enables the attendant to obtain a view of the entire stage. The switchboard comprises four circuit panels and one panel for "black-out" switches, rapidly cutting out the stage and auditorium lights controlled from this point.

The four panels mentioned control seventy-eight circuits with the aggregate capacity of 1,500 amperes, all connexions being placed on the front to comply with the regulations of the London County Council.

Of the seventy-eight circuits, twelve supply stage arc lights, thirty-two are ordinary stage circuits with "dimming" resistances, twenty are auditorium circuits also with "dimming" resistances, and fourteen are stage general lighting circuits. The regulators for the dimmers are on the same platform as the panels, and the resistances are placed directly above on an iron and teak platform.

For the lighting of the dressing-rooms twenty-four circuits are provided from a switchboard near the stage entrance.

The stage lighting system includes about 2,300 metallic filament lamps in eight battens of 200 lamps each—white, red, blue, and amber. The battens of lamps are suspended over the stage, and their height can be regulated as desired by means of hand winches. The footlights include 250 lamps in four colours, and the proscenium is illuminated by fifty lamps in three tints. Among special lighting arrangements for scenic purposes there are fourteen lines of twenty-four lamps, six bunches of twelve lamps, and numerous wall-plugs for arc and incandescent lamps. In addition there are six arc-lamps for lightning effects, all controlled by a special switch at the "prompt" side, and eight projecting arc-lamps with scissor shutters for sunrise, sunset, rainbow, cloud, storm, and waterfall effects.

Illuminated signal-boards are fitted in the flies and "prompt" corner, all controlled from a twelve-switch operating board for the use of the stage manager.

The power installation includes two 100-ampere circuits, one for ventilating-fans and the other for a deep-well pump and a 25-ampere circuit for power on the stage. The main switchboard for these circuits is situated in the intake chamber.

Circuits for general lighting proceed from two switchboards placed at each side of the main entrance. One board controls thirty-seven circuits and the other seventy-eight circuits.

One of the most interesting features of the auditorium and other public departments of the house is the reflected system of diffused light, to which the lights attached to exposed electroliers and other fittings serve the auxiliary purpose of furnishing more brilliant local illumination.

Suspended from the ceiling of the auditorium, a large centre fitting of circular form contains 400 lamps with reflectors. This fitting weighs 1 ton, and can be lowered to the stalls floor for lamp renewals, cleaning, or repair. The other exposed lights are placed on electroliers, pendants, flambeaux, and brackets.

The verandah over the foot-pavement in Kingsway is lighted by some 300 lamps, and other high candle-power lamps are employed for the exterior illumination of this building.

To provide a reasonable safeguard against the risk of interrupted service the dual system of lighting has been applied in every part of the house, so that if a temporary breakdown should occur in one source of supply the circuits served by the other source would still furnish ample light.

More than 5,000 incandescent metallic filament lamps are included in the lighting installation, which is one of the best examples of the kind in the metropolis.

The switchboards, cables, wires, and reflectors were made by Messrs. Siemens Brothers and Co., Ltd., and Messrs. Malcolm & Allan supplied their special wiring boxes in connexion with the screwed, solid drawn-steel conduit tubes through which the wires are drawn on the looped-in system. The wrought-iron brackets for lamps on the

exterior of the building were made by Messrs. T. W. Vaughan & Co., Ltd. (late Vaughan & Brown).

Heating and Ventilation System.

The warming and ventilation of the building is effected partly on a modification of the plenum system and partly by means of direct radiators and exhaust fans, the whole of the work having been carried out by Messrs. Strode & Co., of Osnaburgh-street, N.W.

Steam for both parts of the installation is generated at 5 lb. pressure and reduced to atmospheric pressure for use in radiators through which and the service mains it is circulated by means of pumps.

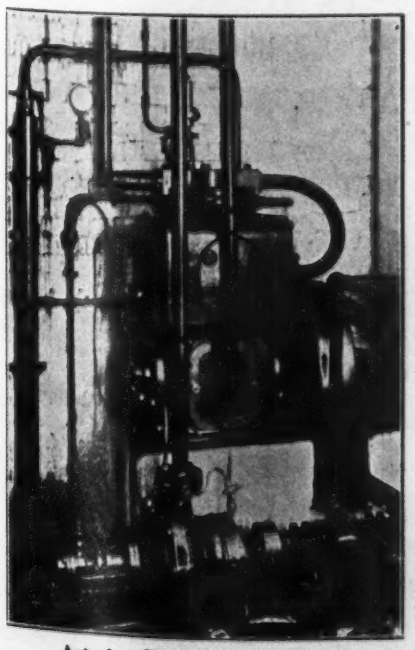
For warming and ventilating the auditorium, air drawn from the exterior is forced through a steam-heated battery by means of a 40-in. diameter air blower of the enclosed pressure type, and after having been filtered and washed is distributed through main ducts below the level of the stalls floor, and branch ducts of concrete or galvanised iron with outlets in the stalls, box tier, grand circle, lower gallery, upper gallery, and all other parts of the house open to the public.

Instead of relying upon the main blowing-fan for the ejection of vitiated air from the building as in the plenum system properly so termed, auxiliary exhaust fans are employed, two in the roof of the auditorium and two others for the extraction of air from the entrance hall and other apartments in the same part of the house. Thus the result is a combination of the plenum and exhaust systems of ventilation, and has the advantage of providing very effectively for the removal of vitiated air. The installation is capable of maintaining a temperature of about 70° in the auditorium. The stage and various rooms in the same part of the building are warmed by means of steam-heated radiators applied without mechanical ventilation. The steam generating plant is also employed for heating water in calorifiers for the hot water services to the dressing-rooms and elsewhere.

Artesian Well.

Following the example which has been set by the proprietors of numerous important buildings in London in consequence of the excessive rates demanded under the rateable value basis of charges, Mr. Hammerstein has had an artesian well of 7 in. internal diameter sunk to the depth of 460 ft. 5 in. below the surface, and is thus enabled to obtain a supply of 3,000 gallons per hour if required at exceedingly moderate cost.

The well was sunk by the Artesian Well Boring Company, of Pentonville, and passes through the following strata :—Basement 10 ft., made-up ground 3 ft., gravel 5 ft., brown clay 1 ft., London clay 19 ft., sandy blue clay 2 ft., London clay 91 ft., mottled clay 25 ft., black clay 4 ft., mottled clay 11 ft., pebble bed 4 ft., brown sands and pebbles 5 ft., green sands 30 ft. 6 in., Thanet sand and flint 2 ft., chalk and some flints 247 ft. 11 in., making up the total depth of 460 ft. 5 in.



Artesian Well Boring Plant.

The standing water level is 220 ft. below the surface, and water is raised by means of the air lift system.

We are informed that examination by an eminent analyst shows the water to be of great purity organically, it being almost free from salts of lime or magnesia, and containing sodium salts in notable proportion.

Conclusion.

The general building contractors were the Building Construction Company, Ltd., of Cockspur-street, S.W., and Mr. G. Sheen was the clerk of works. In addition to the plaster-work executed by Messrs. J. Tanner & Son, the fibrous plaster decoration of the auditorium was carried out by Messrs. A. R. Dean & Co., of Birmingham, and the fire-resisting partitions throughout were supplied by Messrs. A. & S. Wheater, of Stoke Newington. Ornamental bronzework, including the handsome entrance grilles, was manufactured by Messrs. T. Brawn & Co., of Birmingham, and Messrs. T. W. Vaughan & Co., Ltd., of Islington, supplied brass rails and the exterior torch brackets. The whole of the sanitary fittings were provided by Messrs. John Jones, Ltd., of Chelsea, and the wood-block flooring was laid by the Acme Flooring and Paving Company, of Hackney. Mr. F. G. Minter, of Putney, was responsible for the joinery work, and Messrs. Hammond & Champness, of Old Kent-road, supplied the goods lift for the stage department. The foregoing names, as well as those of specialist firms previously mentioned, serve to suggest the enormous mass of details which had to be considered by the architect in addition to the artistic and structural features of this important building.

Fig. 1. Small Section Kahn Bar.

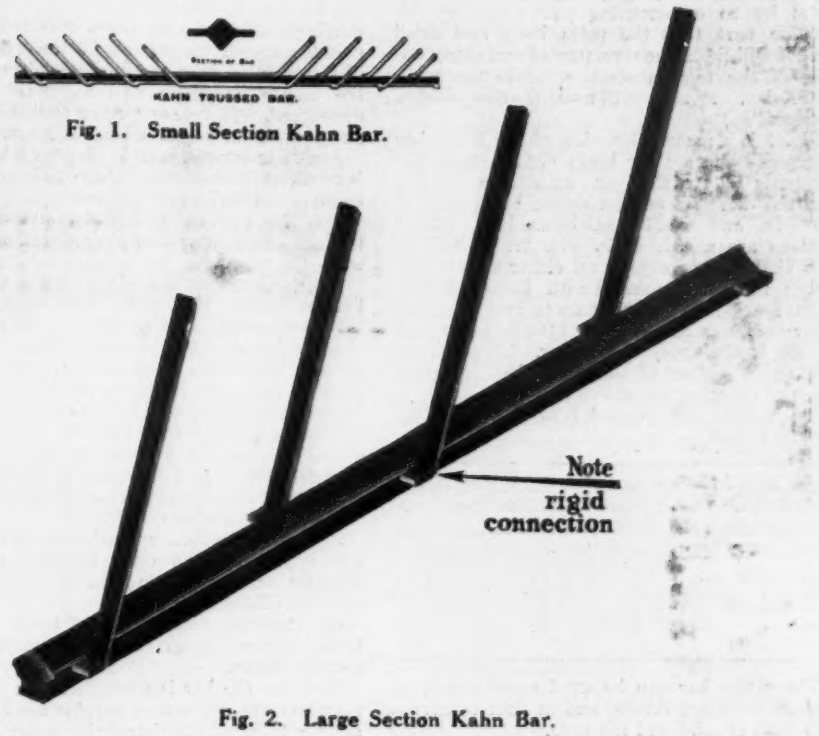


Fig. 2. Large Section Kahn Bar.

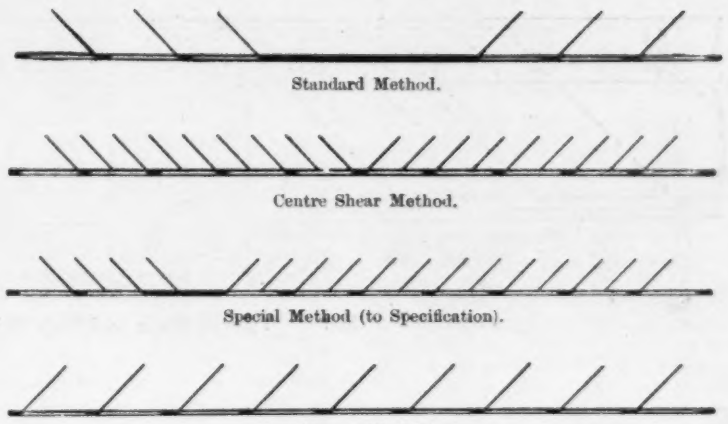


Fig. 3. Various Shearings of Kahn Bars.

REINFORCED CONCRETE IN GREAT BRITAIN.—IV.

By W. Noble Twelvetrees.

(*Continued from page 332.*)

Systems of Class (b).

As previously stated, most of the firms supplying special forms of reinforcement are prepared to supply designs for the application of their specialities, exactly in accordance with the practice of firms whose systems come under Class (a), and it should be noted that the general arrangement of the reinforcement is usually similar to the arrangements adopted by designers who make use of ordinary commercial bars and forms of steel. As in the case of systems under Class (a), we deal with the various systems now to be considered as far as possible in the order of their introduction in this country.

Kahn System.—This system was originated in 1903 by Julius Kahn, of Detroit, U.S.A., and was largely adopted in the United States and Canada before its introduction here in 1906. The English company was formed in March, 1907, under the style of the Trussed Concrete Steel Company, Ltd., with offices at Caxton House, Westminster.

The British patent granted to Mr. Kahn, in 1903, was amended in the same year in accordance with the decision of the Comptroller-General of the Patent Office. The amended specification contains a large number of claims which we need not mention individually. Therefore, we summarise briefly the main features of the invention, which has for object "the obtaining of trussed members in which a part of the truss consists of metal of novel construction and arrangement, and the remaining part of the truss either in integral cementitious substance or a plurality of blocks. It is the further object of the invention to obtain

the maximum of strength with the minimum of metal by so constructing and arranging the metallic part that the main body and arms thereof will lie in the direction of and along the lines of the tension stresses, while the body material . . . . will resist the compression stresses."

Fig. 1 is a perspective view of the Kahn bar as usually sheared for beam construction, the diagonals alternating on each side of the bar, the diamond section shown being that of the ½-in. and small ⅝-in. beam bar. Larger sections are rolled, as in Fig. 2. It will be seen that flanges extend on either side of the body; these are sheared with L-shaped cuts so that strips may be bent up to form diagonal shear members being rigidly attached and part of the main tension member. This is the distinctive feature of the Kahn bar. Various types of shearing are shown in Fig. 3.

Kahn bars are produced in the following standard sizes:—

Dimensions of Body.	Thickness of Wings.	Overall Width.	Weight per Foot.
	In.	In.	Lb.
½ in. square	¼	1¼	1·4
⅝ in. ,, ...	5/16	2 5/16	2·7
1¼ in. irregular	⅜	2¾	4·8
1½ in. ,, ...	½	2¾	6·9

The Kahn bar can be used equally well in beam, cantilever, lintels, and in floor construction both of solid and tile type.

Fig. 4 represents a typical method of using the bars in beams and floors. In the case of continuous beams and slabs, inverted bars of suitable length are placed in the upper part of the member over the intermediate supports, the above members of diagonals pointing downward. These are termed continuity bars, and provide for negative bending moments.

A similar arrangement is adopted where steel is required to assist the concrete in compression, the inverted bar lying in the area of compression, while the upward and downward diagonals inclined at an angle of 45 deg. form a latticed web.

Fig. 5 illustrates the adaptation of the Kahn bar to hollow tile floors, the reinforcement being embedded in wide concrete joints between rows of hollow tiles, the main beams being as already described. This type of floor can be used in spans up to 36 ft. without secondary beams, thus giving a flat soffit over large areas.

Column footings are reinforced by two series of bars crossing each other at right angles as illustrated in section and plan by Fig. 6.

The advantages claimed for the Kahn trussed bar are the following:—

(1) That the shear members are rigidly attached in accordance with theoretical requirements, thereby obviating the risk of misplacement or omission.

(2) That the diagonals, bent up to 45 deg., intersect the planes of both horizontal and vertical shear.

(3) That the bar is economical, as the shear members are cut out of surplus steel and the middle third of the bar being unsheared the flanges are available for resistance to tensile stress where necessary.

(4) That the labour of shaping, fixing, and holding the bars in position while the concrete is placed is eliminated.

The Trussed Concrete Steel Company, Ltd., supply another type of reinforcement in the form of a mechanical bond bar known as the Kahn Rib Bar, illustrated in Fig. 7. This differs from some deformed bars in that the metal has not been distorted from a straight line, and it is claimed that whereas distorted bars previously used waste some 25 per cent. of metal, the loss of section in this bar is not more than 5 per cent., as the only material lost is that in the transverse ribs. The bar is rolled in sizes from ⅜ in., rising by ⅛ in. to 1½ in., the cross-sectional area corresponding with the area of a square bar of the same designation. Bars of this type are used for vertical and panel reinforcements, and can be applied to any system of reinforcement. Where applied to columns the vertical bars are bound with steel of round or flat section.

Fig. 8 illustrates the Kahn Hy-Rib sheeting, manufactured from single sheets of steel so as to form a steel lath surface stiffened by folded projecting ribs. Applied vertically it obviates the use of studding, and used horizontally it saves the cost of centring. This type of reinforcement is applicable to the construction of floors, roofs, walls, partitions, and kindred structures. In floors and roofs it is used in conjunction with reinforced concrete or other beams, and itself forms centring for the deposition of concrete. In walls and partitions it is

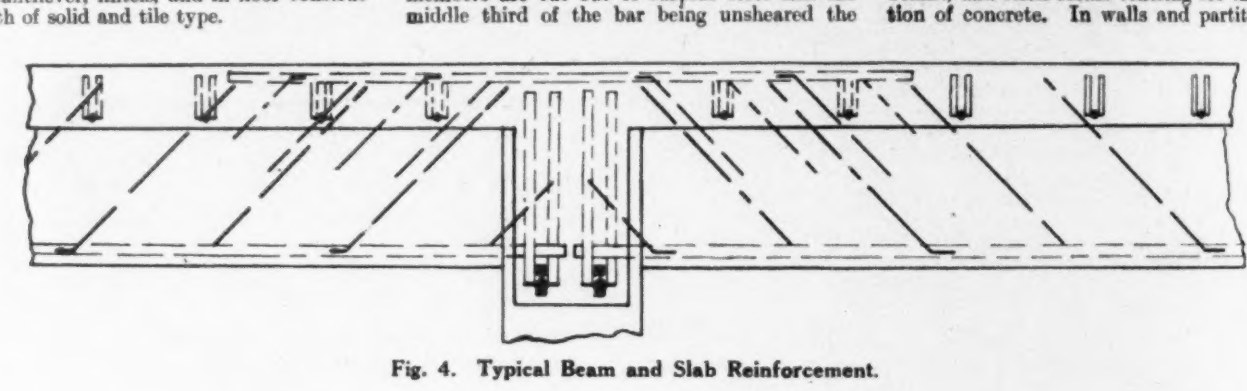


Fig. 4. Typical Beam and Slab Reinforcement.

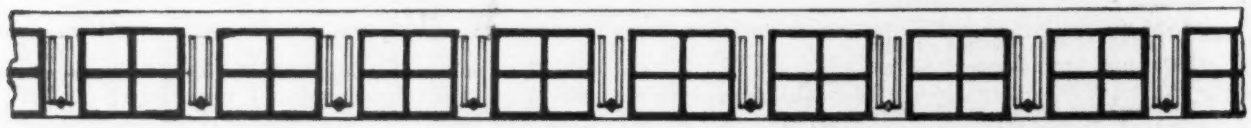


Fig. 5. Hollow Tile Floor Reinforcement.

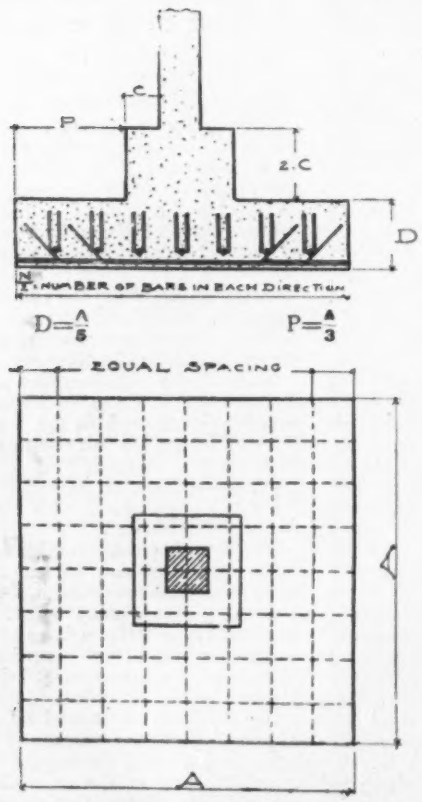


Fig. 6. Column Footing.

Fig. 7. Rib Bar Profile.

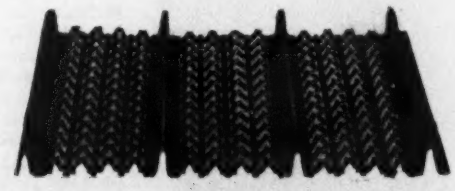


Fig. 8. Hy-Rib Sheeting.

ILLUSTRATIONS TO KAHN SYSTEM OF REINFORCED CONCRETE.

set in place and rendered in cement, the rigid ribs making studs unnecessary. Clips and fixing plates are supplied, as well as cutters and punches to facilitate operations.

All products of the Trussed Concrete Steel Company are supplied at rates which cover patent royalties, specifications, and detailed working drawings. No charge is made for designs, providing the Kahn system is specified for any given work. All types of reinforcement made by the company are sold freely to builders and others: there are no licensed contractors, and special contractors are not necessarily employed.

The Piketty System.—Messrs Paul Piketty & Co., 14, 16, and 18, Bloomsbury-street, W.C., write us that in the article on their system, in our issue of last week, no mention is made as to their patent method of increasing the limit of elasticity of ordinary mild steel intended for use as laterals and stirrups, by stretching, so as to obtain the quality of a higher steel resistance between the limit of resistance of elasticity, thus procuring a higher tension steel resistance at the price of ordinary mild steel. By this means all the resistance that the metal is able to give between the limit of elasticity and the limit of resistance is utilised, with the advantage that any cracking of concrete can only be reached in the higher stresses.

(To be continued.)

BOOKS.

Lectures on Cement. By BERTRAM BLOUNT, F.I.C. (The Institute of Chemistry of Great Britain and Ireland. London: 1912. Pp. 64. 2s. 6d.)

THE lectures delivered by the author at King's College last year, and now issued in pamphlet form, deserve to be in the hands of all cement-users and architectural students. After an historical outline of the evolution of calcareous cements, the author discusses the chemical reactions and physical changes occurring in the production and setting of cements, modes of testing, and the standardisation of tests, which are necessarily of arbitrary character. A particularly serviceable part of the pamphlet is that where attention is drawn to the errors that may occur in consequence of the unintelligent use of cements, the causes of failure in cement structures, and the importance of discrimination in the selection of aggregate employed in making mortar and concrete. The pamphlet concludes with four appendices, two referring to analytical methods, and the last summarising certain significant clauses of the British standard specification for Portland cement.

Everyday Uses of Portland Cement. Second Edition. (Published by the Associated Portland Cement Manufacturers (1900), Ltd., London. Pp. 348. Paper covers, 1s. 6d.; stiff covers, 2s. 6d.)

ALTHOUGH published by a manufacturing company, this exceedingly useful and interesting book is fully equal in literary and technical merit to many of the treatises on concrete and reinforced concrete now so plentiful. The information conveyed as to the composition, preparation, and deposition of concrete, the construction of moulds, concrete block practice, and other matters is judiciously selected and expressed, and the illustrated examples of the uses of concrete will probably lead many readers to make extended employment of that excellent structural material.

Hennebique Ferro-Concrete: List of Works Executed in the United Kingdom, 1897-1911. Second Edition. (Published by L. G. Mouchel & Partners, Westminster. Pp. 95.)

IN this pamphlet brief particulars are given of more than a thousand ferro-concrete structures in the British Isles, together with the names of the persons or authorities for whom they were built, and of the architects or engineers responsible. The list, which is classified in counties and districts, ought to be of great convenience to architects desiring to inspect works carried out on the system concerned. Most of the structures mentioned in the pamphlet relate to building construction, but it is interesting to note that the list includes some 100 reservoirs and tanks, eighty wharves, jetties, and quays, and 100 highway and other bridges. Bearing in mind the large number of reinforced concrete works executed on the many other systems now available, it is evident that the new method of construction has been very widely adopted in the United Kingdom.

The Clayworker's Hand-Book. By ALFRED B. SEARLE. Second Edition. Thirty-two Illustrations. Revised and rewritten. (London: Charles Griffin & Co., Ltd. 1911. Pp. 416. 6s. net.)

SINCE publication of the first edition of this work considerable developments have taken place in the clayworking industries, and much additional information on the subject has been accumulated. The objects of the author are to make clear the characteristics of the various materials used, to explain the operations of obtaining and preparing the clay, and to describe manufacturing processes in such manner as to enable the clayworker to secure the most satisfactory work possible out of the machinery and plant available. These aims have been carried out in a thorough and essentially practical manner, and in its revised form the book should gain fresh popularity among the class to whom it is addressed.

British Clays, Shales, and Sands. By ALFRED B. SEARLE. With ten plates and fifty-three figures in the text. (London: Charles Griffin & Co., Ltd. 1912. Pp. 451. 7s. 6d. net.)

THE chief purpose of this book is to set forth in proper order the characteristics of the clays, shales, and sands occurring in the United Kingdom, together with information as to the localities where they are to be obtained in remunerative quantities. The attempt has not been made to describe the beds in question with the minuteness of a geological survey, but the author has evidently made a point of denoting, as far as possible within the limits of a relatively small volume, the areas where deposits of present or future commercial value may be found. The practical utility of such a book becomes evident when it is remembered that in most geological works palæontology receives far more attention than the more mundane considerations which lead clayworkers and other industrial classes to study geology. The task undertaken by the author has obviously involved an immense amount of labour, and he is to be congratulated on the encyclopædic collection of data now placed at the disposal of industrial firms and professional men interested in deposits of the kind indicated by the title of his new book.

Simple Calculations for Sanitary Officials and Students. (London: The Sanitary Publishing Co., Ltd. Pp. 34. 1s. net.)

THESE calculations are so very simple that we are a little inclined to wonder why it should be necessary to publish them. They relate chiefly to the computation of area, volume, the flow of water, and other elementary arithmetical operations. Those who require guidance in such work will find this little book all that can be desired.

Report on the Gypsum Deposits of the Maritime Provinces. By WILLIAM T. JENNISON, M.E. (Ottawa: Government Printing Bureau. 1911. Pp. 171.)

PREPARED for the Canadian Department of Mines, this report is in the form of a monograph on the gypsum deposits of Nova Scotia, New Brunswick, and the Magdalen Islands. By description, photographs, and maps, it shows the vast extent of the deposits, the processes and cost of manufacturing commercial gypsum, and the uses of the material. The report makes interesting reading matter and is of special value to all engaged in manufactures involving the employment of gypsum products.

Theory and Practice in Designing. By HENRY ADAMS, M.Inst.C.E., late Professor of Engineering at the City of London College. (London: Constable & Co., Ltd. 1911. Pp. 240. 6s. net.)

PROFESSOR ADAMS has written many helpful books on the design of structures, and the present work comes under the same category, although intentionally or inadvertently the title does not indicate what kind of designing is discussed.

As a text-book the treatise may be taken up by the mere beginner, for everything is explained in perfectly clear language, and the text is unencumbered by complicated mathematical formulæ. Moreover, it ought to be found of practical utility as a book of reference to architects and engineers engaged in structural design. The subjects treated include the design of beams, columns, roofs, steel-framed sheds, bridges, arches, and retaining walls. Steel preponderates as the material of construction, but timber, cast-iron, and stone also find a place in various chapters. The illustrations throughout are prepared from drawings and form a valuable feature of this useful work.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W. Captain G. S. Swinton, Chairman, presiding for the last time prior to his departure to India as a member of the Delhi Town Planning Committee.

LOANS.—The Finance Committee recommended and it was agreed to make a loan of 8,768*l.* to the Battersea Borough Council for an electricity generating plant; and a loan of 14,029*l.* to the Hackney Borough Council for improvements.

NEW SCHOOL.—It is proposed to erect, if necessary, a new school to accommodate 768 children on the Victory-place site, Bermondsey, and to enlarge the Paragon School, Bermondsey, to provide accommodation for an additional 240 children.

GREENWICH PIER.—It was recommended by the Highways Committee that owing to the condition of the river berth in front of the pier at the Greenwich generating station it was desirable to make an efficient and stable berth by driving a row of piles along a portion of the frontage and to lay concrete and chalk up to the piles to make a level bed.

LEGAL COLUMN.

Workmen's Compensation.

Some curious accidents have come to the notice of the Courts under the Workmen's Compensation Act, of which the recent case, Peel *v.* William Lawrence & Sons, Ltd., furnishes an example. A man employed in a cotton mill sprained a tendon of his finger whilst removing one of his socks. It is common knowledge that such accidents will sometimes occur in performing some quite simple and ordinary daily operation, but the question for the Court was whether the man was entitled to compensation from his employers.

It appeared that the men, for their own convenience and possibly even to render themselves more efficient, were in the habit of removing their socks; but the Court of Appeal has held that there was no special risk of such an accident incidental to the employment, and therefore the accident did not arise out of the employment. The accident happened ten minutes before actual work commenced, but as the man was preparing himself for the work this did not affect the case, as had the accident been connected with the employment it would have arisen "in the course of it."

There is a legal axiom, *de minimis non curat lex*, but under the Workmen's Compensation Act the law has to take notice of trivial incidents, as a considerable sum in compensation may arise out of them. A man may snap a tendon on his leg whilst merely walking, or he may strain his finger in undressing; if he is ascending a particular ladder, or if he is

assuming a dress necessary to his employment, very awkward questions may arise as to the connexion between the accident and his employment.

Patent Law.

In the case *re* Taylor's patent, recently tried before Mr. Justice Parker, the working of sect. 27 of the Patents Act, 1907, had to be considered. The patent in question related to mechanical underfeed "stokers," and on the application of the Erith Engineering Company the Comptroller had made an order under sect. 27 for its revocation. The owners had acquired the patent in 1908, and, even before assignment, had advertised it here and written to engineering firms about it. There was, however, in this country a patent, Daley's patent, now in the hands of the Erith Company, and in America there were two patents, one corresponding to Taylor's patent (that which had been revoked), and another corresponding to Daley's patent, and in 1909 there was litigation in the United States, and it was decided that Daley's patent was the master patent, and it was therefore admitted that Taylor's patent could not be worked here without infringing Daley's patent. Then the owners ceased further to exploit the patent.

The position, therefore, was this:—The only persons who could enable Taylor's patent to be worked here were the owners of Daley's patent, who were applying for its revocation. If they had granted a licence under their patent they could not subsequently take proceedings under sect. 27; but they contended that the owners of Taylor's patent should have applied under sect. 24 for a compulsory licence.

The Court held that the applicants for revocation had made out a *prima facie* case under sect. 27, but the owners of the patent had rebutted it by showing that the only persons who could enable it to be worked were the applicants themselves, and the non-application for a voluntary or compulsory licence was not in the circumstances of this case a sufficient reason for revoking the patent.

LAW REPORT.

West Kirby Sailing Club: County Court Case.

At the Birkenhead County Court on the 15th inst. his Honour Judge Yorke Stanger gave judgment in the case of Messrs. E. F. Blakeley & Co., engineers, of Liverpool, who sued the West Kirby Sailing Club for 87*l.* 15s. 9d. in respect to the erection of the clubhouse supplied to the defendants.

Mr. Layton (instructed by Messrs. Oliver Jones, Billson, & Co.) represented plaintiffs, and Mr. A. R. Kennedy (instructed by Messrs. Simpson, North, Harley, & Co.) was for defendants.

The case was partly heard in December last, when it was said by Mr. Layton that his clients were a firm of engineers. The defendants were respectively President and Commodore of the West Kirby Sailing Club.

On the suggestion of his Honour, the case was adjourned and sent to an arbitrator, Mr. Henry Hartley, architect and surveyor, of Liverpool. The arbitrator found that defendants were due to pay to plaintiffs 60*l.* 10s. 8d. for extra work and material supplied, and that plaintiffs were due to pay to defendants the sum of 63*l.* 2s. 10d. on account of defective material and workmanship, inasmuch as the weather boarding supplied was not weather boarding, the internal lining boarding was not seasoned timber, and was not properly fixed, the sills of window casings were defective, also the floors were uneven for want of proper footings to the brick piers supporting the building.

His Honour was of opinion that the action was one which should never have been brought into Court.

He gave judgment for defendants with the general costs on Scale C.

LONDON COUNCILS.

Barnes.—An offer to give up land for road widening off Temple Sheen-road has been accepted by the Council, and kerbing and channelling works are to be carried out at an estimated cost of 160*l.* Plans by the Surveyor have been approved for making-up Washington-road.

Barnet.—At the last meeting of the Barnet Hospital Committee Mr. Pill, of Messrs. White, Son, & Pill, was appointed architect in connexion with extensions to be carried out to the isolation hospital. The estimated cost of the work is put at 3,000*l.*

Croydon.—The tender of Messrs. W. Smith & Sons, London-road, at 14,493*l.*, has been accepted for the erection of the boys' school.

Ealing.—For making-up a portion of Midhurst-road, West Ealing, with indurated Victoria stone, the tender of Messrs. Clements, Knowling, & Co., at 627*l.*, has been accepted by the Town Council.

Lambeth.—During the ensuing year repairs are to be carried out in various roads throughout the Borough at an estimated cost of 18,371*l.*

Richmond.—Wood-paving is to be laid in Kew-road at an estimated cost of 20,500*l.*, which sum includes relaying a part of the existing kerbing.

Shoreditch.—Electricity mains are to be extended in the Bethnal Green area at an estimated cost of 230*l.* Westmoreland-place is to be opened up into Murray-street by the demolishing of Nos. 48-50, Murray-street. The cost of the whole work, including paving, etc., is put at 1,800*l.*

Southwark.—The tender of Mr. W. Vanstone, 61, Chandos-street, Strand, W.C., at 323*l.*, has been accepted for carrying out alterations and decorations at the Central Library.

Stepney.—The tenders of Messrs. Ashby & Horner, at 410*l.* and 354*l.*, have been accepted for carrying out redecorations and structural alterations, and supplying fittings respectively at the Mile End Library; as has also the tender of Messrs. J. H. Sankey & Son, Ltd., for the annual supply of Portland cement, at 1*l.* 8s 11d. per ton.

Thames Ditton.—Imber Park-road is to be made up at an estimated cost of 901*l.*

Tottenham.—The following tenders have been accepted by the Urban District Council:—Mr. E. T. Bloomfield, Tottenham, at 131*l.* and 127*l.*, for making-up Castle Wood-road and Moundfield-road respectively; Mr. J. Adams, Wood Green, at 106*l.*, for making-up part of Holcombe-road; Mr. E. Knifton, Edmonton, at 385*l.* 3s. 3d., for making-up the remainder of Hampden-road. Plans have been passed for Mr. F. Brooking, 4, St. Anne's-road, for the erection of three shops and houses in High-road; also for Messrs. Brand, Pettitt, & Co., for the erection of a garage at the rear of 200, High-road. Mr. H. S. Couchman has lodged plans for the erection of a shop and warehouse in Bruce-grove.

Wandsworth.—That part of Upper Richmond-road, Putney, between Priory-lane and Priests'-bridge, is to be paved in three sections:—(1) With Cormastik road material; (2) with Durax armouring; and (3) with granite macadam with Plascom binding material. For carrying out the work of sections 1 and 2, the tenders of the British Trust Corporation, Ltd., and the Durax Dustless Roads, Ltd., have been accepted at 5s. and free maintenance for three years, and 7s. 5d. and free maintenance for five years, respectively. The work for the third section is to be carried out by the Borough Engineer at an estimated cost of 4s. per yard super. Tenders are to be invited for flagging the footway of a portion of Upper Richmond-road. A 12-in. pipe sewer is to be constructed in a portion of Wimbledon Park-road, Southfield, at an estimated cost of 360*l.* The tender of Mr. Thomas Adams, at 687*l.*, and schedule prices for extras or omissions, has been accepted for paving Normanhurst-road, Streatham; as has also the tender of Mr. J. Mears, at 230*l.*, and schedule prices for extras or omissions, for paving a portion of Upper Richmond-road, Putney. In both cases the footways are to be paved with Aberdeen adamant. Plans have been passed for Messrs. Swain & Selley for the erection of eight shops in Upper Tooting-road, also for Messrs. Holliday & Stanger for fourteen houses in Woodbourne-avenue, Streatham.

West Ham.—Portions of Saville-road and Leonard-street are to be made up as new streets. The following plans have been passed:—Messrs. F. & F. J. Wood, additions to offices, at Messrs. Suter, Hartmann, & Co.'s premises, Silvertown; Messrs. Clemens Brothers, four houses, Capel-road, Forest Gate; Mr. W. Sweetingham, alterations and additions to cinematograph hall, Rathbone-street, Canning Town. Plans have been lodged by Messrs. W. & T. R. Milburn, Mr. S. Knight, and Mr. F. Parnell to erect a workshop and store at the rear of the Empire Theatre, Broadway, Stratford; to adapt the Salisbury Hall, Romford-road, Stratford, as a cinematograph theatre; and to make alterations to the cinematograph theatre, Adamson-road, Custom House, respectively. The Education Committee have approved plans prepared by the Architect for the erection of two schools and a handicraft centre, and for the enlargement of the Water-lane and Harold-road handicraft centres.

Westminster.—The north-east corner of the garden enclosure in Parliament-square is to be rounded off at an estimated cost of 130*l.*

OBITUARY.

Mr. F. W. Albury.

The death, on March 23, at Parkside, Reading, is announced of Mr. Frederick William Albury. Mr. Albury was elected in 1866 an Associate, and in 1875 a Fellow of the Royal Institute of British Architects. In February, 1910, he took into partnership Mr. H. Whiteman Rising, F.R.I.B.A. (1903), of Norfolk-street, Strand, and also his old pupil and friend, Mr. E. P. Morgan, who had been in his office for the past twenty-five years, under the style of Messrs. Albury, Rising, & Morgan, of No. 154, Friar-street, Reading, and Oswaldestre House, Norfolk-street, Strand, W.C. In 1907 Mr. Albury was nominated in a competition, limited to three architects, to submit designs for the public library and reading-rooms in Oxford-road, West End, Reading, and his designs, in the Renaissance manner, were chosen. The building is of red brick with oolitic stone dressings, with a main frontage of 120 ft., erected by Messrs. J. Kingerlee & Sons, of Oxford, at a cost of nearly 4,000*l.*, and all the public rooms are upon the ground floor. He was the architect of the Palmer Memorial Building and Temperance Institute in West-street, built by Mr. Whiting on a contract for 4,750*l.*; Mr. A. H. Bull's premises in Broad-street; St. Saviour's Church Sunday-schools; and, with Mr. George W. Webb (1898), of the Wellington Club, Reading. The funeral was fixed for Thursday, 28th inst., at Christchurch, Whitley, Reading.

FOREIGN AND COLONIAL.

Y.M.C.A. Buildings, Toronto.

With reference to the notice on p. 279 of the *Board of Trade Journal* of February 9, 1911, relative to the proposed construction of a new central building for the Young Men's Christian Association at Toronto, the Imperial Trade Correspondent at that place (Mr. F. W. Field) reports that the plans of the proposed building, the cost of which is estimated at 529,000 dollars (about 109,000*l.*), have now been approved. Some further particulars regarding the construction and furnishing of the building, together with a plan, may be seen, and the name and address of the firm of architects obtained, by British manufacturers at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, London, E.C.

Building in Servia.

The *Nachrichten für Handel* (Berlin) of February 26 announces that proposals for allocating the following sums for the purposes indicated have been discussed in the present session of the Skupschina:—800,000 dinars (32,000*l.*) for University requirements, including the erection of a building for the technical section; 400,000 dinars (16,000*l.*) for the building of a national library; a subsidy of 200,000 dinars (8,000*l.*) for the erection of a building for the Academy of Science. The following further grants have also been proposed:—250,000 dinars (10,000*l.*) for the erection of a gymnasium and 750,000 dinars (30,000*l.*) for other school requirements. From the Sanitary Funds are allocated:—1,600,000 dinars (64,000*l.*) for a lunatic asylum, 1,245,000 dinars (49,800*l.*) for the completion of the public hospital in Belgrade, 2,800,000 dinars (112,000*l.*) for the erection of a hospital in the interior of the country, and 700,000 dinars (28,000*l.*) for improvements at three Servian Spas.

Roadmaking, Building Construction, etc., Congo State.

With reference to the notice on p. 68 of the *Board of Trade Journal* of January 11 relative to the Congo State budget expenditure for 1912, it is notified that the *Moniteur Belge* (Brussels) of March 16 contains a decree approving an extraordinary expenditure of 42,419,103 francs (about 1,696,800*l.*) in the Congo State during 1912. It may be noted that, *inter alia*, that 18,983,000 francs (about 759,300*l.*) have been earmarked for public works, such as road-making, building construction, establishment of telegraph lines, sanitary work, etc., and 1,700,000 francs (about 68,000*l.*) for the establishment of wireless telegraph stations.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxii.

Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

MARCH 30.—**Edinburgh.**—MEMORIAL TO KING EDWARD.—Limited. See Competition News, p. 151, February 9.

MARCH 31.—**Manitoba, Canada.**—PARLIAMENT BUILDINGS.—The Government of Manitoba invite designs for the new Parliament buildings to be erected in the City of Winnipeg. See advertisement in issue of February 9 for further particulars

APRIL 13. — **Ormskirk.** — CLUB-HOUSE.—Competitive plans are invited for proposed club-house for Ormskirk Golf Club. See advertisement in issue of March 1 for further particulars.

APRIL 20.—**Birmingham.**—BLUE COAT SCHOOL.—Limited to local architects. Assessors, Mr. G. H. Hunt, F.R.I.B.A., and Mr. C. E. Bateman, F.R.I.B.A. Particulars from the Secretary, the Blue Coat School, Birmingham.

MAY 1.—**Rhos Ruabon.**—PAIR OF WORKMEN'S COTTAGES.—Premiums of 10*l.* and 5*l.* Assessor, Mr. Raymond Unwin, F.R.I.B.A. Particulars from Mr. G. Meirion Griffiths, Rhos Ruabon.

MAY 1. — **Wombwell.**—SWIMMING BATHS.—The Wombwell U.D.C. invite designs in competition for public swimming baths, to be erected in Hough-lane, Wombwell, Yorkshire. Three prizes of the value of 40*l.*, 30*l.*, and 20*l.* respectively are offered for the designs placed first, second and third respectively by the assessor. See advertisement in issue of February 16 for further particulars.

MAY 15.—**Portland.**—COUNCIL OFFICES.—The Portland U.D.C invite competitive designs and plans for Council Offices. See advertisement in issue of March 8 for further particulars.

JUNE 1.—**Dunfermline.**—INSTITUTE AT NETHERTOWN.—Cost not to exceed 7,000*l.* Premiums of 20*l.*, 15*l.*, and 10*l.* Assessor, Mr. E. A. Jamieson. Particulars from the Secretary, Carnegie Trust, Abbot-street, Dunfermline.

JUNE 28.—**Hale, Cheshire.**—TOWN PLANNING SCHEME.—Premiums 50*l.* and 25*l.* Particulars from the Council Offices, Hale.

JUNE 30.—**Padiham.**—TOWN HALL, BATHS, ETC.—Premiums 40*l.* and 20*l.* Particulars from Mr. J. Gregson, A.M.Inst.C.E., Surveyor's Office, Padiham.

JULY 1.—**Dusseldorf.**—A plan for the extension of the City of Dusseldorf. Premiums of 1,000*l.* to 375*l.* Conditions on application to the Chief Burgomaster, Dusseldorf. A translation appeared on page 365, September 29.

AUGUST 30. — SAXON SNELL PRIZE. — Fifty guineas; with medal, is offered for essay on a hospital subject. Particulars from the Sanitary Institute, 90, Buckingham Palace-road, S.W.

NO DATE.—**Cardiff.**—FOOTBALL STANDS.—Premiums 30*l.*, 20*l.*, and 10*l.* Particulars from Mr. C. S. Arthur, 53, Queen-street, Cardiff.

NO DATE.—**Jordanhill, Glasgow.**—PROPOSED TRAINING COLLEGE.—Limited to six firms, named in Competition News, December 1, page 635.

NO DATE. — **Sheffield.** — CRIPPLES' HOME. — Limited to local architects. Mr. E. M. Gibbs, F.R.I.B.A., and Mr. F. E. P. Edwards, F.R.I.B.A., assessors.

NO DATE. — **Warrington.** — SCHOOL. — The Warrington Education Committee invite competitive plans for the erection of a public elementary school. See advertisement in issue of February 16 for further particulars.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

MARCH 29.—**Eastbourne.**—CONVENIENCES.—For the erection of public conveniences in Gildredge Park. Plan and specification seen, and form of tender from Mr. A. E. Prescott, Borough Surveyor, Town Hall, Eastbourne.

MARCH 30.—**Aspatria.**—HOUSES.—For erection of two dwelling-houses in Lawson-street. Plans and specifications with Mr. Robert Bell, Richmond Hill, Aspatria.

MARCH 30.—**Bursiem.**—ADDITIONS.—For erection of additions to the Workhouse, Chell. Mr. W. F. Slater, architect, Overhouse-chambers, Burslem. Deposit of 3*l.* 3s.

MARCH 30. — **Fulneck.** — HEADQUARTERS.—For erection of new headquarters for the Boys' Brigade at Fulneck. Drawings seen, and quantities from Messrs. C. S. Nelson and G. Birkinshaw, architects, Sun-buildings, 15, Park-row, Leeds.

MARCH 30. — **Llancarvan (Glam.).** — HOUSE.—For erection of a house at Fingerpost. Plans and specifications with Mr. Coleman, tenant, on site.

MARCH 30.—**Martin.**—REPAIRS, ETC.—For renovation and repairs of Wesleyan chapel and vestry. Mr. J. W. Webster, Martin, Lincoln.

MARCH 30.—**Monmouth.**—COTTAGES, ETC.—For the erection of cottage and homestead on holding No. 1 in Henllys; three cottages on holdings near Llanhilleth, in the parish of Abercarn; two cottages, with stables and cart-sheds, on holdings Nos. 1 and 2 in Llanmartin. Plans and specifications, on deposit of 1*l.* 1s., from Mr. C. Reginald Harding, county land agent, County Council-buildings, Newport, Mon.

MARCH 30. — **Rhymney.** — STABLES, ETC. — For erection of new stables and motor-house, etc., for Messrs. A. Buchan & Co. Plans and specification with Mr. Thomas Roderick, architect, Clifton-street, Aberdare.

APRIL 1.—**Alnwick.**—HOUSE.—For erection of a two-storied dwelling-house on Alnwick Moor. Plan and specification with Mr. M. T. Wilson, M.R.S.I., architect, Alnwick.

APRIL 1.—**Bristol.**—STAIRCASE, ETC.—For erection of a staircase at Eastville Workhouse; painting, etc., in relief depôt at Eastville; painting, etc., the male consumptive hospital at Southmead Workhouse. Mr. J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital, Bristol.

APRIL 1.—**Cleckheaton.**—WALLS, ETC.—For erection of boundary walls, bandstand shelter, laying-out of footpaths, etc. Plans and conditions of contract seen and forms of tender and quantities from Mr. C. Lund, M.I.M. and C.E., Town Hall, Cleckheaton.

APRIL 1.—**Gower.**—SEA WALL.—For the erection of a sea wall between the road and the beach, in front of Beach-terrace, Penclawdd. Specifications, quantities, and form of tender from Mr. H. J. Ind, Clerk to the Council, Central Buildings, Fisher-street, Swansea. Information from the Council's Surveyor, Mr. G. A. Jones, Fairfield, Three Crosses, Dunvant, S.O., Glamorgan.

APRIL 2. — **Aberfan.** — PICTURE PALACE. — For erection of picture palace for the Aberfan Picture Palace Company, Ltd. Plan and specifications seen, and quantities from Mr. T. E. Rees, architect, Bank-chambers, Merthyr Tydfil. Deposit of 2*l.*

APRIL 2.—**Brentford.**—SUBWAYS.—For the extension of existing pipe subways at the Infirmary, Isleworth. Plans and specifications by Mr. E. R. Dolby, M.Inst.C.E. (Messrs. Dolby & Williamson, 8, Prince's-street, Westminster, S.W.). Deposit of 2*l.* 2s.

APRIL 2.—**Halifax.**—ADDITIONS.—For additions and alterations to Highroad Well Congregational Chapel. Messrs. Clement Williams & Sons, architects, Post-office Buildings, Commercial-street.

APRIL 3.—**Abercarn.**—PREMISES.—For erection of new premises for the Abercarn Working Men's Club and Institute. Plans and specification with Mr. R. L. Roberts, M.S.A., Abercarn.

APRIL 3.—**Barnsley.**—EXTENSION.—For the extension of the Old Town School. Plans and specifications seen, and quantities from the architect, Mr. E. W. Dyson, Regent-street, Barnsley.

APRIL 3.—**Farnham Common.**—RESERVOIR.—Erection of a storage reservoir for the Burnham, Dorney, and Hitcham Waterworks Company, Ltd. Plans with Mr. C. S. Vardy, P.A.S.I., architect and surveyor, Cliveden-chambers, Maidenhead. Quantities on deposit of 10s.

APRIL 4.—**Barnsley.**—HOUSE, ETC.—For erection of a caretaker's house and committee-room, etc., near the Midhope Reservoir at Upper Midhope, near Penistone. Drawings and specification seen, and quantities, with forms of tender, from Mr. J. Henry Taylor, M.Inst.C.E., Waterworks Manager, Manor House Offices, Barnsley.

* APRIL 4.—**Bognor.**—THREE SHOPS.—Tenders are invited for three shops at Camden-gardens, London-road, Bognor, Sussex. See advertisement in this issue for further particulars.

APRIL 4. — **Huddersfield.** — INN. — For taking down and re-erecting the Plough Inn. Messrs. Kirk & Sons, architects, Central-buildings, Market-place, Huddersfield. Deposit of 1*l.* 1s.

APRIL 6.—**Aspatria.**—HOUSE, ETC.—For erection of dwelling-house and shop in Queen-street. Plans and specifications with Mr. R. Bell, Richmond Hill, Aspatria, Cumberland.

APRIL 6.—**Chesterfield.** — CONVENIENCES.—For the demolition of the existing urinal and the erection of new public conveniences in Cavendish-street. Plans and specification seen and quantities and form of tender at the Borough Surveyor's Office, Salter-gate.

APRIL 6. — **Chesterfield.** — EXTENSIONS.—For extensions to engine-house and boiler-house at the Borough Electricity Works. Plans and specification seen and quantities and form of tender from the Borough Electrical Engineer's Office, Chatsworth-road. Deposit of 1*l.* 1s.

APRIL 8. — **Coventry.** — DWELLINGS.—For erection of thirty-two workmen's dwellings, Pridmore-road. Drawings and conditions of contract and specification seen, and form of tender and quantities, on deposit of 1*l.* 1s., from Mr. J. E. Swindlehurst, City Engineer and Surveyor, St. Mary's Hall.

APRIL 8.—**Kendal.**—BANDSTAND.—Construction of an oak bandstand at the Abbot Hall Recreation Grounds. Plans, conditions of contract, specification, quantities, and form of tender from Mr. F. W. Oxberry, Borough Surveyor, Town Hall, Kendal.

APRIL 8. — **Windsor.** — DEMOLITION. — For the demolition of two blocks of soldiers' quarters and part of one block of latrines, also filling basements, making-up parades, gravelling, etc., at the Victoria Infantry Barracks, Windsor. Plans, specification, and conditions of contract at the office of the Director of Barrack Construction, 80, Pall Mall, London, S.W., or at the Barrack Construction Office at the Victoria Infantry Barracks, Windsor. Deposit of 10s.

APRIL 10.—**Margam.**—HOUSE, ETC.—Alterations at public baths and erection of caretaker's house. Plans and specifications seen, and forms of tender, on deposit of 2*l.* 2s., from the Surveyor, Mr. John Cox, Port Talbot.

APRIL 11. — **Abingdon.** — POST-OFFICE. — For alterations to Abingdon Post-office. Drawings, specification, and conditions and form of contract at Abingdon Post-office. Quantities and forms of tender, on deposit of 1*l.* 1s., from the Secretary, H.M. Office of Works, etc., Storey's-gate, London, S.W.

APRIL 12.—**Bugsworth.**—ADDITIONS, ETC.—For alterations and additions to the Council school. Drawings and specification with Mr. George H. Widdows, A.R.I.B.A., Architect to the Committee, County Education Office, St. Mary's-gate, Derby. Quantities on deposit of 1*l.* 1s.

APRIL 12. — **Pontselly.** — ALTERATIONS. — For alterations to a house called "Quarry Mawr." Drawings and specifications with Mr. J. Teifion J. Williams, architect, Napier-street, Cardigan.

* APRIL 13.—**Brymbo.**—DRILL-HALL, ETC.—The Denbighshire Territorial Force Association invite tenders for a drill-hall, miniature rifle-range, etc. See advertisement in this issue for further particulars.

APRIL 13. — **Denbigh.** — DRILL-HALL, ETC.—For the construction of a drill-hall, caretaker's house, and miniature rifle-range at Brymbo, Denbighshire, for the 4th Battalion Royal Welsh Fusiliers. Drawings, specifications, and form of contract with the architect, Mr. C. D. Rutter, M.S.A., Parr's Bank Buildings-chambers, Wrexham. Quantities on deposit of 1*l.* 1s.

APRIL 13. — **Manchester.** — SCHOOL.—For erection of a new municipal school in Grange-street, Bradford, Manchester. Plans seen and quantities at the Education Offices, Deansgate, Manchester, on deposit of 2*l.* 2s.

APRIL 15.—**Romiley.**—SCHOOL.—For erection of a new elementary school in Sandy-lane, Romiley, near Stockport. Plans and specifications seen, and quantities from the Architect, Mr. Joseph Holt, A.R.I.B.A., 9, Albert-square, Manchester, on deposit of 1*l.*

APRIL 15.—**Tonbridge.**—SCHOOL.—Erection of new county school. Plans and specification, by the Committee's Architect, Mr. W. H. Robinson, M.S.A., seen with Mr. Fras. W. Crook, Secretary, Caxton House, Westminster, S.W.

* APRIL 16.—**Lambeth.**—PORTER'S LODGE, ETC.—The Lambeth Guardians invite tenders for erection of porter's lodge, dispensary, and extension of nurses' home at the Infirmary, Brook-street, S.E. See advertisement in this issue for further particulars.

* APRIL 17.—**Southampton.**—NEW CLOAKROOM.—The Southampton C.C. invite tenders for the erection of a new cloakroom at the Itchen Ludlow-road School. See advertisement in this issue for further particulars.

APRIL 19. — **Basingstoke.** — WORKS. — For foundation works for the new asylum to be erected at Park Prewett, near Basingstoke, Hants. Plans and specification by architects, Messrs. George T. Hine & H. Carter Pegg, of 35, Parliament-street, Westminster, S.W. Deposit of 5*l.*

* APRIL 20.—**Bexley.**—BRANCH LIBRARY.—The Bexley U.D.C. invite tenders for proposed branch library. See advertisement in this issue for further particulars.

* APRIL 24. — **Limbury.** — SCHOOL. — The Bedfordshire C.C. invite tenders for new Council school. See advertisement in this issue for further particulars.

NO DATE.—**Ardglass.**—SHOP.—For erection and completion of a shop and dwelling. Plans and specification with Messrs. Browne Brothers, architects, Ardglass, Ireland.

NO DATE.—**Baildon.**—ALTERATIONS, ETC.—For alterations and redraining sanitary conveniences

BUILDING—continued.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

at Lower Holme Mills. Mr. A. Sharp, architect, Market-street, Bradford.

No DATE.—**Barnsley.**—FACTORY.—Erection of a new factory at Stocks-lane. Plans and specifications seen, and quantities from Messrs. R. Castle & Son, architects, London City and Midland Bank-chambers, Cleckheaton.

No DATE.—**Basford.**—ADDITIONS.—For alterations and additions to lavatory accommodation at the Workhouse, Highbury-road, Bulwell. Names, with deposit of 1*l.* 1s., to Mr. W. V. Betts, architect, Radford-road, Old Basford, Nottingham.

No DATE.—**Billingham.**—SCHOOL.—Alterations and additions to existing buildings and erection of a new infants' department at Church schools. Messrs Clark & Moscrop, FF.R.I.B.A., architects, Darlington.

No DATE.—**Buxton.**—HOUSE.—For erection of farmhouse, Street House Farm, London-road. Mr. G. E. Garlick, Quadrant-chambers, Buxton, and Spring Bank, New Mills.

No DATE. — **Devon.** — ADDITIONS, ETC. — For alterations and additions to farm buildings, for the Devon County Council. Messrs. Ellis, Son, & Bowden, F.S.I., surveyors, Bedford-chambers, Exeter.

No DATE. — **Dowlais.** — ADDITIONS, ETC. — For alterations and additions to the Plough Inn, at Lower High-street. Mr. J. T. Jenkins, M.S.A., architect and surveyor, Porth (Glam.). Deposit of 2*l.* 2s. for quantities.

No DATE. — **Harrogate.** — COTTAGE, ETC.—Erection of a warehouse, stabling, and cottage near East-parade. Mr. Samuel Stead, architect, Westminster-chambers, Station-parade, Harrogate.

No DATE.—**Horncastle.**—HOUSE.—For the construction of a new court-house. Mr. James Thropp, County Surveyor. Offices: 29, Broadgate, Lincoln.

No DATE.—**Manningham.**—CHURCH, ETC.—For erection of a mission church and school for St. Luke's parish, Manningham, Bradford. Plans with Messrs. T. H & F. Healey, architects, 42, Tyrrel-street, Bradford.

No DATE.—**Masham.**—HALL.—For erection of a town hall. Mr J. Houfe, architect and surveyor, Albert-chambers, Albert-street, Harrogate.

No DATE.—**Pontefract.**—MORTUARY.—For erection of a public mortuary. Mr. John E. Pickard, Borough Surveyor, Municipal Offices, Pontefract.

No DATE.—**Pontefract.**—STABLES.—For erection of stables. Mr. John E. Pickard, Borough Surveyor, Municipal Offices, Pontefract.

No DATE. — **Silloth.** — ADDITIONS.—For alterations and additions to premises, Eden-street. Plans and information with Mr. George Armstrong, architect, 24, Bank-street, Carlisle.

ENGINEERING, IRON, AND STEEL.

APRIL 2. — **Newcastle-on-Tyne.** — CULVERT.—For the construction of a reinforced concrete culvert in the valley of the Ouse Burn, and other works. Specification, quantities, and form of tender, on deposit of 3*l* 3s., from the City Engineer, Town Hall, Newcastle-upon-Tyne.

APRIL 3.—**Belfast.**—TRIAL PITS.—For sinking trial pits and boreholes in the Silent Valley. Specification by Mr. F. W. M'Cullough, M.Inst.C.E., at the Water Office.

APRIL 3.—**Blackpool.**—HEATING.—For heating the Palatine-road new Council school. Particulars, with plans, from Mr. J. S. Brodie, Borough Engineer.

APRIL 4.—**Aberdeen.**—BRIDGE, ETC.—For construction of sidings, platforms, steel footbridge, culvert, and other works north of Guild-street Bridge. Drawings seen, and quantities, on deposit of 1*l.* 1s., from the engineer, Mr. James A. Parker, 80, Guild-street, Aberdeen.

APRIL 5.—**Brongwyn.**—BRIDGE.—Erection of a new footbridge at Porth, Brongwyn. Plan and specifications at the Post-office, Ponthirwen. Mr. Thomas Evans, Surveyor, Pantyrlis, Llechryd

APRIL 12. — **Cricklewood.** — ENGINES. — The Metropolitan Water Board invite tenders for the erection of six installations of Diesel oil-engines to actuate horizontal three-throw ram pumps, with pipes, connexions, and all appurtenant works; also two 10-ton travellers. To be erected at the Board's Cricklewood pumping-station, with a 10-ton traveller, etc., and a similar installation to be erected at the Board's Fortis Green station. Drawings, conditions of contract, and specification at the offices of the Board (Chief Engineer's Department), Savoy-court, Strand, W.C.

APRIL 12 — **Darenth.** — ENGINE. — The Metropolitan Water Board invite tenders for the erection of a Diesel oil-engine, with pumping machinery, pipes, connexions, and all appurtenant works, also 8-ton traveller, etc., at Green-street Green, in the parish of Darenth, Kent. Drawings, conditions of contract, and specification at the offices of the Board (Chief Engineer's Department), Savoy-court, Strand, W.C.

* APRIL 15.—**West Ham.**—IRON STAIRCASES.—The West Ham B.C. invite tenders for external iron staircases at Denmark-street and Water-lane Schools. See advertisement in this issue for further particulars.

APRIL 17. — **Mayfield.** — RESERVOIR.—For erection and construction of a pumping-station and reservoir. Plans and site of works seen, and quantities, on deposit of 2*l.* 2s., from Mr. Luther Adams, Surveyor to the Council, Stanton, near Ashbourne.

FURNITURE, PAINTING, MATERIALS, etc.

MARCH 29.—**Ealing.**—PAINTING.—For external painting of municipal cottages in North and South roads, South Ealing. Specifications seen, and forms of tender from Mr. C. Jopes, M.Inst.C.E., Borough Engineer, Town Hall, Ealing, W. Deposit of 1*l.* 1s.

APRIL 2.—**Rochdale.**—PAINTING.—For external painting at the Smith-street establishment, for the Baths Committee. Particulars from Mr. P. W. Hathaway, A.R.I.B.A., Town Hall.

APRIL 2. — **Thorne (Yorks).** — PAINTING.—For painting at the isolation hospital. Mr. J. Stanley, Surveyor, Thorne.

APRIL 3.—**Durham.**—PAINTING.—For painting buildings, gates, etc., at the Cemetery, Blackhill. Specification with the architect, Mr. J. J. Eltringham, Blackhill, Durham.

APRIL 3.—**London.**—PAINTING.—For cleaning and painting the exterior of the public baths and wash-houses, Lime-grove, Shepherd's Bush, and Addison-gardens bridge. Forms of tender and specification from Mr. H. Mair, M.Inst.C.E., Borough Surveyor, Town Hall, Broadway, Hammersmith, W.

* APRIL 3.—**Various.**—CLEANING AND PAINTING.—The Midland Railway Company invite tenders for cleaning and painting at following:—Somers Town, Edwalton, Plumtree, Widmerpool, Upper Broughton, Old Dalby, Grimston, Holwell Sidings, Geddington, Weldon and Corby, Gretton, and Harringworth. See advertisement in this issue for further particulars.

APRIL 6.—**Glasgow.**—PAINTING.—For cleaning and painting at Belvidere Hospital. Specifications and forms of tender at the Office of Public Works, City Chambers, 64, Cochrane-street.

APRIL 10.—**Leeds.**—PAINTING.—For painting at the city hospitals. Specification and quantities at the Stewards' Office, Seacroft Hospital.

* APRIL 15.—**West Ham.**—BLINDS.—The West Ham B.C. invite tenders for supplying and fixing blinds at Gainsborough-road Schools. See advertisement in this issue for further particulars.

* APRIL 18.—**London, N.**—PAINTING.—The St. Mary, Islington, Guardians invite tenders for painting, whitewashing, etc., at Infirmary, Highgate-hill, N. See advertisement in this issue for further particulars.

* APRIL 18.—**Tooting.**—PAINTING.—The Wandsworth Guardians invite tenders for painting works at Tooting Home, Church-lane. See advertisement in this issue for further particulars.

APRIL 19. — **Blackpool.** — REPAIRS, ETC. — For decorations and repairs to the central and branch police-stations. Forms of specification from Mr. T. A. Connely, on site of proposed Palatine-road, Council school.

ROADS, SANITARY AND WATER WORKS.

MARCH 29.—**Brandon.**—SEWAGE.—For construction of sewer, with manholes, etc. Quantities from Mr. G. G. Donkin, Surveyor, Langley Moor, Durham.

MARCH 30.—**Alton.**—GRANITE.—For supply of broken granite. Forms of tender from Mr. C. W. Maudsley, Surveyor, Park Close, Alton.

MARCH 30.—**North Witchford.**—GRANITE.—For supply of granite, iron slag, flints, rag-stone, and sand. Mr. A. W. Broker, Surveyor, Wimblington

MARCH 30.—**Stoke-on-Trent.**—ROAD.—For the culverting of about 70 yds. of the Scotia Brook, in Tunstall Park. Plans seen, and quantities, on deposit of 2*l.* 2s., from the Borough Surveyor, Town Hall, Stoke-on-Trent.

APRIL 1.—**Bridgwater.**—GRANITE.—For supply of broken granite. Forms of tender from Mr. W. A. Collins, Surveyor, 56A, Eastover, Bridgwater.

APRIL 1.—**Bulkington.**—STONE.—For supply of stone. Forms of tender from Mr. E. Cuthbert, Surveyor, Council Offices, Bulkington.

APRIL 1.—**Droxford.**—GRANITE.—For supply of granite. Forms of tender from Mr. A. V. Carter, Surveyor, Droxford, near Bishop's Waltham, Hants.

APRIL 1.—**Glasgow.**—SEWER.—For the construction of a 12-in. pipe sewer in Cathcart-road. Specifications and forms of tender at the Office of Public Works, City Chambers, 64, Cochrane-street.

APRIL 2.—**Limerick.**—SETTS.—For supply of paving setts. Specification and form of tender from the Surveyor, Town Hall, Limerick.

APRIL 2. — **Llandaff.** — STREETS. — For private street improvement works. Plans and specifications seen, and quantities from the Surveyor, Mr. James Holden, A.M.Inst.C.E., Park House, Park-place, Cardiff.

APRIL 2.—**Maldon.**—MATERIALS.—For supply of materials. Forms of tender and particulars from Mr. E. J. Ennals, Surveyor, 6, Market-hill, Maldon.

APRIL 2.—**Portslade.**—MATERIALS.—For supply of broken granite, clean hill surface flints, screened dug flints. Forms of tender and particulars from the Surveyor, Mr. A. T. Allen, 46, St. Andrew's-road, Portslade-by-Sea.

APRIL 2.—**Rumney.**—SEWAGE.—For the construction of a system of sewerage for the parish of Rumney, near Cardiff. Plans and specification seen, and quantities and form of tender on deposit of 5*l.* Mr. A. H. Rees, Clerk to the Council, Queen's-hill, Newport, Mon.

APRIL 3.—**Hugil.**—ROAD.—For road diversion at Ings, Hugil. Plans, specification, and quantities at the office of Mr. Joseph Bintley, County Surveyor, 7, Lowther-street, Kendal.

APRIL 3. — **Newton.** — SEWERS, ETC. — For the construction of pipe sewers and relative works. Plans may be seen, and specification from Mr. W. L. Douglass, M.Inst.C.E., District Engineer, District Offices, Hamilton. Deposit of 1*l.*

APRIL 3. — **Shepton Mallet.** — MAIN. — For trenching and laying about 1,950 yds 4-in. and 30 yds. 5-in. cast-iron main at Gurney Slade, near Binegar. Specification from the Council's Engineer, Mr. William Phelps, C.E., Shepton Mallet. Deposit of 2s. 6d.

APRIL 4. — **Shrewsbury.** — SEWAGE.—For construction of sewage outfall works at Pontesbury. Specifications and quantities, on deposit of 1*l.* 1s., from Mr. H. Asher, Surveyor, 24, St. John's-hill, Shrewsbury.

APRIL 6.—**Newark.**—SEWAGE.—For extension of the sewage disposal works at North Collingham. Plans seen, and contract and tender forms from the Surveyor, Mr. R. Oakden, jun., A.M.Inst.C.E., 27, Winchilsea-avenue, Newark.

APRIL 8.—**Barrowford.**—STREETS.—For various street works. Specifications and forms of tender from Mr. G. W. Hewes, Surveyor to the Council.

APRIL 9. — **Bath.** — CASTINGS, ETC. — Cast-iron pipes and special castings. Quantities from the Engineer, Mr. W. H. Radford, C.E., Albion-chambers, Nottingham. Deposit of 2*l.* 2s.

APRIL 9. — **Southgate.** — STREET WORKS.—For private street improvements. Plans with the Council's Surveyor, Mr. C. G. Lawson, C.E., Council Offices, Palmers Green, N. Deposit of 2*l.*

APRIL 10. — **Birmingham.** — SEWER.—For construction of brick and concrete foul-water sewer, with an overflow chamber and manhole, in Sandy-lane. Plan and specification seen, and quantities and forms of tender from Mr. Henry E. Stilgoe, M.Inst.C.E., City Engineer and Surveyor, The Council House, Birmingham. Deposit of 2*l.*

APRIL 10.—**Rawtenstall.**—PAVING, ETC.—For the paving and sewering, etc., of streets. Plans and sections seen, and specifications, conditions, and forms of tender from Mr. Jas. Johnson, Borough Surveyor, Municipal Offices, Rawtenstall. Deposit of 2*l.* 2s.

APRIL 10. — **Salford.** — SEWAGE.—For concrete tube sewer and brick sewer, with necessary manholes. Particulars from Borough Engineer, Town Hall, Salford.

APRIL 12.—**Frodsham Bridge.**—SEWAGE.—For providing and laying stoneware pipes and cast-iron pipes, and construction of eighteen manholes and adjunct works, near Frodsham Bridge, Cheshire. Plans seen, and specification and quantities from the Engineer, Mr. W. M. Beckett, A.M.Inst.C.E., 33, Brazennose-street, Manchester. Deposit of 1*l.* 1s

* APRIL 12. — **Hendon.** — STORM-WATER SEWER, ETC.—The Hendon U.D.C. invite tenders for the laying of storm-water sewers, together with manholes, inspection-chambers, and gullies. See advertisement in this issue for further particulars.

APRIL 12. — **Runcorn.** — SEWAGE.—For laying stoneware pipes, cast-iron pipes, and construction of eighteen manholes and adjunct works. Plans seen and specification and quantities from the Engineer, Mr. W. M. Beckett, A.M.Inst.C.E., 33, Brazennose-street, Manchester. Deposit of 1*l.* 1s.

APRIL 15.—**Brighouse.**—SETTS.—For supply of granite setts. Particulars and forms of tender from Mr. S. S. Haywood, Borough Engineer, Borough Engineer's Office, Brighouse.

APRIL 26.—**Brighton.**—SEWERS.—For the construction of sewers. Specifications and forms of tenders at the office of the Borough Surveyor at the Town Hall, Brighton. Deposit of 1*l.* 1s.

NO DATE.—**Hanley.**—WALL.—For excavation of new course, Fowlea Brook, and erecting breast-wall in concrete. Messrs. E. L. Maddock & Sons, architects, Hanley.

NO DATE.—**Newport.**—SEWER.—For constructing sewer and road off Oakfield-road, Newport. Plans and specification seen, and quantities from Messrs. Ernest Page & Lister, architects and surveyors, Crown-chambers, Newport, Mon.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*DIOCESAN SURVEYOR	Diocese of Ely	Not stated	April 15
*VALUER AND SURVEYOR (IRELAND)	Civil Service Commission	Not stated	April 18

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, BOARDS, TIMBER, ETC.—Great Hall, Winchester House, E.C.	Churchill & Sim	April 3
*LEASEHOLD PROPERTY, PLANT, MACHINERY, & BUILDER'S STK.—On the Prems.	Bradshaw Brown & Co.	April 11
*FREEHOLD BUILDING PROPERTY, CROUCH-HILL, N.—At the Mart	Edwin Fox, Bousfield, Burnetts, & Baddeley	April 17
*FREEHOLD BUILDING LAND, STAMFORD-HILL, N.—At the Mart	Edwin Fox, Bousfield, Burnetts, & Baddeley	April 17
*FACTORY PROPERTY, GREENFORD—At the Mart	S. Walker & Son	April 18

PATENTS.

APPLICATIONS PUBLISHED.*

10,349 of 1911.—Robert Kirk and Newcastle Grindstone and Pulpstone Company, Ltd.: Moulds for moulding plastic and similar substances.

15,057 of 1911.—William Beedle, Frederick Chopping, and John Gibbon How: Taps, cocks, and the like.

24,606 of 1911. Frank Iliff: Heating and ventilating apparatus.

1,042 of 1912.—John Bratley: Draught excluders for doors.

9,292 of 1911.—Jean Philippe Burger and Wilhelm Müller: Earth anchor.

10,505 of 1911.—Ernest Walter Johnston: Locks for window-sashes.

15,168 of 1911.—John Pilling: Sash windows.

22,037 of 1911.—Niels Martin Hansen and De Vilbiss Manufacturing Company: Air brushes for applying liquid paint, powder, or the like.

22,544 of 1911.—Callender's Cable and Construction Company, John Charles Augustine Ward, and Harry Percival Harvey Anderson: Apparatus for opening and closing doors.

22,802 of 1911.—Martinus Rappard: Manufacture of paint for protecting iron, wood, and the like from sea-growths.

23,168 of 1911.—William Sherman Scarbury: Window-holders for sliding sashes.

23,921 of 1911.—Karl Emil Gustav Hahn: Chimney and ventilating shaft tops.

24,919 of 1911.—Joseph Fowler Cowper: Metal reinforcements for use in reinforced concrete floors, beams, pillars, roofs, and similar structures.

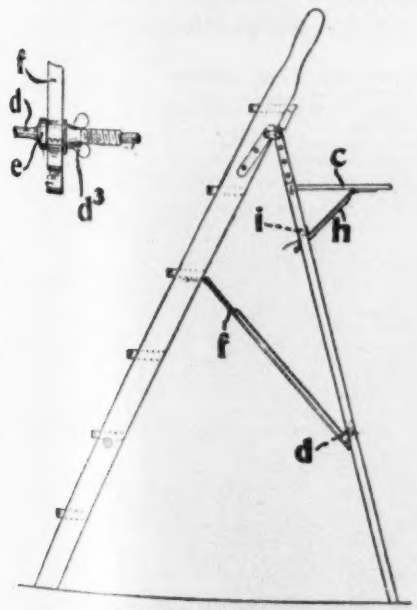
25,462 of 1911.—Thomas Benjamin Colman: Fire-resisting panelling for doors and decorative purposes.

25,992 of 1911.—Edouard Picha: Process of manufacturing flooring-tiles of cement or other calcareous materials.

SELECTED PATENTS.

24,726 of 1910.—Robert Salisbury: Step-ladders.

This relates to step-ladders and trestles which are provided with folding platforms C pivoted to the back legs and operated by pivoted slotted bars *h*, having loops engaged by cross-rods *i* to lock the bars against movement. The spread of the step-ladder or trestles is adjusted by a pivoted slotted bar *f* with one or more loops engaging a cross-rod *d*, which carries a collar *e* and wing-nut d^3 to clamp the bar *f* in position.

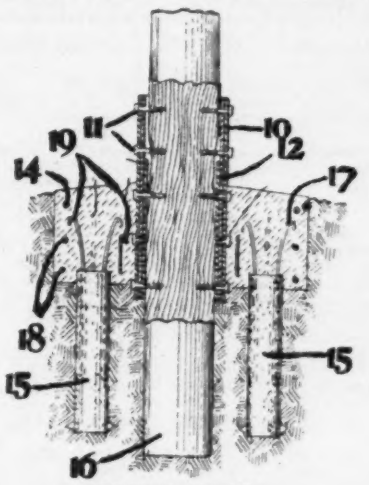


24,726 of 1910.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

24,857 of 1910.—Valentine Konopinski: Posts.

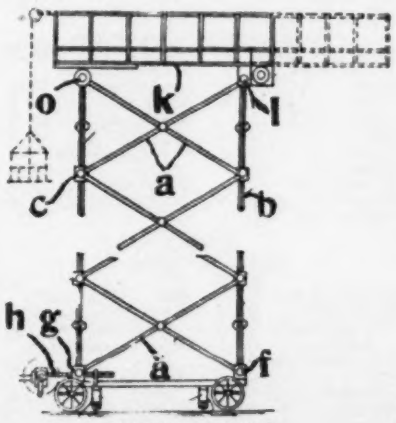
This relates to means whereby posts are protected at the ground line by surrounding them with a sleeve bedded in a flange of concrete or the like. The sleeve 10 is built up of iron plate, and is bolted to the post as at 11, and the space between the pole and the sleeve may be filled in with such material as pitch, and packing-pieces 12 held by short screws are introduced. Small posts 15 of concrete or of wood are forced into the ground round the base 16, and concrete 14 is poured round to form a flange which firmly attaches itself to the sleeve 10 and the reinforcing wires 17 in the posts 15. Reinforcing pieces 18, 19, are bedded in the flange. The posts 15 are made of wood.



24,857 of 1910.

24,936 of 1910.—Gustav Sistermann: Collapsible scaffolding or towers.

This relates to collapsible lazy-tongs structures for scaffolding, look-out towers, and fire-extinguishing apparatus. The structure consists of two systems *a* of lazy-tongs connected by slotted frames *c*, which guide two auxiliary lazy-tongs systems *b*. The lower arms of the lazy-tongs *a* are pivoted at *f* to a car, and at *g* to a sliding member which is operated by screws *h* rotated by handles through worm gearing. The platform *k* is pivoted at *l* to the upper end of the structure, and is provided with rails running on rollers *o*.



24,936 of 1910.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 12.—By ROGERS BROS.

Dulwich.—55 and 57, Crystal Palace-rd., f., y.r. 68l.	£915

March 13.—By DONALDSON & SONS.

Dalston.—11 and 13, Mapledene-rd., u.t. 9½ yrs., g.r. 5l. 10s., e.w.r. 83l. 4s., with policy for 200l.	265
49, Downs Park-rd., u.t. 50 yrs., g.r. 6l. 10s., y.r. 36l.	225
Stoke Newington.—30, Winston-rd., u.t. 48 yrs., g.r. 5l. 5s., y.r. 30l.	210

March 14.—By BEKEN & STOKES.

Walthamstow.—30, Claremont-rd., f., w.r. 27l. 6s.	£245

By H. J. BLISS & SONS.

Forest Gate.—57, Trumpington-rd., u.t. 67 yrs., g.r. 4l. 10s., y.r. 32l.	160
Stepney.—29 and 29A, York-rd., u.t. 38 yrs., g.r. 8l., y. and w.r. 64l. 16s.	120
16 and 17, King John-st., u.t. 35 yrs., g.r. 6l., w.r. 68l. 18s.	325
Mile End.—50, Grafton-st., u.t. 37 yrs., g.r. 4l., w.r. 41l. 12s.	180
12½, St. Dunstan's-rd., u.t. 30¾ yrs., g.r. 3l. 3s., w.r 40l. 6s.	170
Bow.—39, 39A and 39B, St. Stephen's-rd., u.t. 51 yrs., g.r. 10l., w.r. 87l. 2s.	300
Limehouse.—28, Samuel-st., c., w.r. 26l.	190
Holloway.—101 and 103, Cottenham-rd., u.t. 40 yrs., g.r. 12l., w r. 83l. 4s.	195

By CHESTERTON & SONS.

Streatham.—Hildown-rd., f g. rents 16l. 16s., reversion in 97 yrs.	380

By S. H. DAVIDS & CO.

Whitechapel.—18, St. Mark's-st., u.t. 20 yrs., g.r. 4l. 5s., w.r. 58l. 10s.	125
Bow.—7, Huddart-st., u.t. 54 yrs., g r. 5l., w.r. 39l.	190

By E. MARTIN & CO.

Brixton.—178, Leander-rd., u.t. 64 yrs., g.r. 5l., w.r. 41l. 12s.	275

By MATCH & CO.

Hampstead.—18, Albion-rd., u.t. 32¼ yrs., g.r. 10l., p.	720

By STIMSON & SONS.

Blackfriars.—8, Charlotte-st.: 12 and 14, Gray-st. (lodging houses), lease for 13 yrs. at 135l. p.a.	650
Camberwell.—14, Windsor-rd., u.t. 42 yrs., g.r. 10l., y.r. 55l.	205
Wandsworth.—38 and 40, Swaffield-rd., u.t. 75 yrs., g.r. 10l. 10s., w.r. 65l.	340
Norwood.—97 and 99, St Julian's Farm-rd., u.t. 74 yrs., g.r. 14l., y. and w.r. 67l. 14s.	400

By GRIMLEY & SON.

Solihull, Warwick.—Henwood Hall Farm, 144 a. 2 r 7 p., f.	4,800
Knowle, Warwick.—Grimshaw Hall Farm, 132 a. 1 r. 13 p, f. and c.	4,600
Pasture Land, 6 acres, f.	480
Grimshaw-villas, f.g.r. 12l., reversion in 92 yrs.	330
Saltley, Warwick.—151 to 165 (odd), Havelock-rd., u.t. 81 yrs., g.r. 16l. 16s., w.r. 124l. 16s.	860
93 to 109 (odd), Clodeshall-rd., u.t. 86 yrs., g.r. 20l. 5s., w.r. 134l. 11s	600
Aston, Warwick.—49 and 51, High-st. (s.), u.t. 39 yrs., g.r. 6l. 9s. 9d., w,r. 107l. 18s.	460

March 15.—By W. B. HALLET.

Mile End.—53 and 55, Alderney-rd. ; 19 to 27 (odd), Frimley-st., f., y. and w r. 179l. 8s.	1,650
31, Alderney-rd., a d Lg.r. 3l. 11s. 6d., u.t. 29 yrs., g.r. 7l. 3s. 6d., w.r. 39l.	180
178, Mile End-rd. (s.), u.t. 31 yrs., g.r. 9l., y.r. 45l.	270
201 and 203, Mile End-rd. (s.), u.t. 29 yrs., g.r. 27l. 1 s., y.r. 105l.	500
49 to 55 (odd), Kenilworth-rd., u.t. 58 yrs., g.r. 149l. 10s.	650
Stepney.—Rectory-sq., l.g. rents 270l. 10s., u.t. 52 yrs., g.r. 164l.	1,240
Enfield.—84, First-av., u.t. 77 yrs., g.r. 5l., w.r. 35l. 2s.	160
12, Second-av., u.t. 77 yrs., g.r. 4l. 10s., e.w.r. 36l. 8s.	145

By PERCIVAL HODSON.

Holloway.—96 and 98, Mercers-rd., u.t. 52 yrs., g.r. 15l., y.r. 90l.	740
Crouch Hill.—89, Hamley-rd., u.t. 56 yrs., g.r. 7l. 7s., y.r. 36l.	225

By GREEN & SON.

St. John's Wood.—53, Blenheim-ter., f., y.r. 45l.	525

By C. P. WHITELEY & SON.

Camberwell.—110 to 122 (even), Harris-st., f., y.r. 130l.	1,060
6 to 10, Teather-st., f., w.r. 100l. 2s.	500

March 18.—By T. FRAZER.

Holloway.—8, Fulbrook-rd., u.t. 44 yrs., g.r. 6l., e.r. 42l.	310
32, Hampden-rd., f., w.r. 45l. 10s.	210

By WM. HOUGHTON.

Leyton.—265 and 267, Markhouse-rd., u.t. 87 yrs., g.r. 11l., w.r. 62l. 8s.	230

By LOWE, GOLDSCHMIDT, & HOWLAND.

Hampstead.—20, Fellows-rd., u.t. 52¾ yrs., g.r. 2l., y.r. 90l.	500

By DUNN, SOMAN, & COVERDALE.

Robertsbridge, Sussex.—Six cottages, tenement house and shop, f.	950

March 19.—By BALCH, BALCH, & TURNHAM.

Kentish Town.—19, Caversham-rd., u.t. 30 yrs., g.r. 12l., e.r. 60l.	375
52, Patshull-rd., u.t. 48 yrs., g.r. 7l. 7s., y.r. 45l.	390
Camden Town.—19, Georgiani-st., u.t. 27 yrs., g.r. 4l., y.r. 38l.	185

By C. W. DAVIES & SON.

Canonbury.—24, Ashby-rd., u.t. 34 yrs., g r. 6l 6s., y.r. 40l.	280
Islington.—62, High-st. (s.), u.t. 33 yrs., g.r. 50l., y.r. 92l.	240

By GARRETT, WHITE, & POLAND.

Maida Vale.—Nos. 203 to 225 (odd), i.g. rents 151l. 4s., u.t. 23¼ yrs., g.r. 2l.	£1,650
Hyde Park.—38, Westbourne-ter., i.g.r. 55l., u.t. 25¼ yrs., g.r. 10l.	500
Regent's Park.—20, Cornwall-ter., u.t. 8 yrs., g.r. 52l. 10s., y.r. 108l.	515

By MAY & PHILPOT.

Streatham.—25, Streatham High-rd., u.t. 25 yrs., g.r. 6l., p.	350

By KNIGHT, FRANK, & RUTLEY.

Marston Trussell, North Hants.—Thorpe Lubenham Estate, 1,100 acres, f.	47,312
March 21.—By EDWIN FOX, BOUSFIELD, & Co. City.—97, Charterhouse-st., f., y.r. 150l.	2,500

By FRANK JOLLY & JAMES.

Wanstead.—Cambridge Park, Alkham, f., p.	1,900

By GEO. TROLLOPE & SONS.

Watford, Herts.—Rosslyn-rd., Ravello, f., p.	1,500

By KNIGHT, FRANK, & RUTLEY.

Covent Garden.—16, King-st., lease for 6¼ yrs. at 200l. p.a., p.	200
March 21.—By FAREBROTHER, ELLIS, & Co. Soho.—35, Soho-sq.; 14 and 14a., Dean-st. (s.), f., y.r. 325l.	9,600
Sidcup, Kent.—51 and 53, High-st. (s.), f., y.r. 125l.	2,420
Hornsey.—Shaftesbury-rd., f.g.r. 3l. 9s., reversion in 6¼ yrs.	100

By E. J. GAIRDNER.

Harringay.—44, Warham-rd., u.t. 80 yrs., g.r. 6l. 6s., e.r. 35l.	235

By BINGHAM & BROUGHTON.

Bermondsey.—15, Longley-st., u.t. 28 yrs., g.r. 5l., w.r. 39l.	200

By MARTEN & CARNABY.

Sydenham.—17, Crescent Wood-rd., u.t. 35 and 4 yrs., g.r. 46l. 3s., p.	400

By C. C. & T. MOORE.

Bethnal Green.—331, Old Ford-rd., f., w.r. 33l. 16s.	210
Mile End.—138, 140, and 142, Harford-st., u.t. 42 yrs., g.r. 13l. 10s., w.r. 88l. 8s.	360
Plaistow.—70, Hermit-rd. (s.), f., w.r. 36l. 8s.	185

By NEWBON & SHEPHARDS.

Bowes Park.—55 to 65 (odd), Queen's-rd., u.t. 68 yrs., g.r. 27l., w.r. 145l. 12s.	510
23 to 45 (odd), Lascotts-rd., u.t. 67 yrs., g.r. 78l., y.r. 324l.	1,500
Kilburn.—38 and 40, Brondesbury-villas, u.t. 986 yrs., g.r. 32l., y. and e.r. 110l.	300
Islington.—39 and 41, Camden-passage (s.), f., y.r. 80l.	625
Battersea.—1, Prested-rd., f., e.r. 40l.	345
Bournemouth.—Alumhurst-rd., f.g.r. 16l., reversion in 80 yrs.	350

By STIMSON & SONS.

Bermondsey.—Law-st., f.g. rents 38l., reversion in 7 yrs.	1,300
Alice-st., f.g.r. 14l., reversion in 4 yrs.	850
22 to 32 (even), Alice-st.; 12 to 24 (even), Rothsay-st.; 1 to 7, Hargreave-sq., f., w.r. 494l.	2,600
Walworth.—16 to 30 (even), Tiverton-st., f., w.r. 202l. 16s.	750
Old Kent-rd.—Nos. 800, 802, and 804 (s.), f., y. and w.r. 135l.	600

March 22.—By GEO. BILLINGS, WRIGHT, & Co.

Hackney.—76, 78, and 80, Sheep-la., u.t. 20 yrs., g.r. 5l. 15s. 6d., w.r. 87l. 2s.	150
156, 158, and 160, Glyn-rd., u.t. 59 yrs., g.r. 12l., w.r. 106l. 2s.	640
7, Bayford-st., u.t. 59 yrs., g.r. 5l., w.r. 33l. 10s.	180
140, King Edward-rd., u.t. 31 yrs., g.r. 6l. 5s., e.r. 38l.	185

Contractions used in these lists.—F.g.r. for freehold ground-rent; i.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and not to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.	£ s. d.
Best Stocks	1 14 0
Picked Stocks for Facings	2 10 0

Per 1000, Delivered at Railway Depôt.

	£ s. d.		£ s. d.
Flettons	1 13 0	Best Blue Pressed Staffordshire	3 15 0
Best Fareham Red	3 12 0	Do. Bullnose	4 0 0
Best Red Pressed Ruabon Facing	5 0 0	Best Stourbridge Fire Bricks	4 0 0
GLAZED BRICKS—			
Best White, Ivory, and Salt Glzd. Str'tch'rs	11 7 6	Double Headers	13 17 6
Headers	10 17 6	One Side and two Ends	17 17 6
Quoins, Bullnose, and 4½ in. Flats	14 17 6	Two Sides and one End	18 17 6
D'ble Stretchers	16 17 6	Splays & Squints	16 7 6

Second Quality £1 10s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	31 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 13s. 0d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube.

	s. d.
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½
PORTLAND STONE (20 ft. average)—	
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 3
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 4½

Per Ft. Cube, delivered at Railway Depôt.

	s. d.		s. d.
Ancaster in blocks	1 10	Closeburn Red Freestone	2 0
Beer in blocks	1 6	Red Mansfield Freestone	2 4
Greenshill in blocks	1 10	Talacre & Gwespyr Stone	2 4
Darley Dale in blocks	2 4		
Red Corsehill in blocks	2 3		

YORK STONE—*Robin Hood Quality.*

Per Ft. Cube, Delivered at Railway Depôt.	s. d.
Scappled random blocks	2 10

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes)	0 11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7
1½ in. to 2 in. ditto, ditto	0 6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.	
Scappled random blocks	3 0

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landing to sizes (under 40 ft. super.)	2 8
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs (random sizes)	1 2
2 in. self-faced random flags	0 5

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£ s. d.	In. In.	£ s. d.
20×10 best blue Bangor	13 2 6	20×10 best Eur'ka unfading green	15 17 6
20×12 ditto	13 17 6	20×12 ditto	18 7 6
20×10 1st quality ditto	13 0 0	18×10 ditto	13 5 0
20×12 ditto	13 15 0	16×8 ditto	10 5 0
16×8 ditto	7 5 0	20×10 permanent green	11 12 6
22×10 best blue Portmadoc	12 12 6	18×10 ditto	9 12 6
16×8 ditto	6 12 6	16×8 ditto	6 12 6

TILES.

At Railway Depôt.

	s. d.		s. d.
Best plain red roofing (per 1000)	42 0	Best "Hartshill" brand, plain sand-faced (per 1000)	45 0
Hip and Valley (per doz.)	3 7	Do. pressed (per 1000)	42 6
Best Broseley (per 1000)	50 0	Do. Ornamental (per 1000)	47 6
Do. Ornamental (per 1000)	52 6	Hip (per doz.)	4 0
Hip and Valley (per doz.)	4 0	Valley (per doz.)	3 6
Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57 6	Staffords. (Hanley) Reds or Brindled (per 1000)	42 6
Do. Ornamental (per 1000)	60 0	Hand-made sand-faced (per 1000)	45 0
Hip (per doz.)	4 0	Hip (per doz.)	4 0
Valley (per doz.)	3 0	Valley (per doz.)	3 6

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 0 0	15 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by in. and 2 in. by 6 in.	9 10 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¼ in.	1 0 0	"

WOOD (*Continued*).

BUILDING WOOD (*Continued*)—	At per load of 50 ft. £ s. d.	£ s. d.
Fir timber: best middling Danzig or Memel (average specification)	5 0 0	5 10 0
Seconds	4 10 0	5 0 0
Small timber (8 in. to 10 in.)	3 17 6	4 0 0
Small timber (6 in. to 8 in.)	3 5 0	3 10 0
Swedish balks	2 12 6	3 0 0
Pitch-pine timber (30 ft. average)	5 5 0	6 0 0

JOINERS' WOOD.	At per standard. £ s. d.	£ s. d.
White Sea: first yellow deals, 3 in. by 11 in.	24 10 0	25 10 0
3 in. by 9 in.	22 10 0	23 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 0 0
Second yellow deals, 3in. by 11in.	19 0 0	20 0 0
" " 3 in. by 9 in.	18 0 0	19 10 0
Battens, 2½ in. and 3in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 10 0	22 10 0
Do. 3 in. by 9 in.	18 10 0	19 10 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens	11 10 0	12 10 0
Third yellow deals, 3in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 10 0	11 0 0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
" " 3 in. by 9 in.	14 0 0	14 10 0
Battens	11 10 0	12 10 0
Second white deals, 3in. by 11in.	14 0 0	15 0 0
" " 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 10 0	11 0 0
Pitch-pine: deals	19 0 0	21 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	48 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Oddments	28 0 0	"
Kurai Pine—Planks per ft. cube	0 4 6	0 6 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	0 3 9
Small " "	0 2 6	0 2 6
Wainscot Oak Logs, per ft. cube	0 6 6	0 8 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 10	0 1 0
¼ in. do. do.	0 0 8½	—
Dry Mahogany—Houndras, Tabasco, per ft. super. as inch	0 0 10	0 1 1
Selected, Figury, per ft. super. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	0 1 0
Teak, per load	18 0 0	22 0 0
American Whitewood planks, per ft. cube	0 5 0	0 6 0

Prepared Flooring, etc.—	Per square. £ s. d.	£ s. d.
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 0
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. " "	0 14 0	0 18 6
¾ in. by 7 in. white " "	0 10 0	0 11 0
1 in. by 7 in. " "	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 10 0	8 0 0
Compound Girders, ordinary sections	9 10 0	10 0 0
Steel Compound Stanchions	11 0 0	12 0 0
Angles, Tees, and Channels, ordinary sections	9 10 0	10 0 0
Flitch Plates	9 10 0	9 10 0
Cast Iron Columns & Stanchions, including ordinary patterns	7 10 0	8 10 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	9 0 0	9 10 0
Staffordshire Crown Bars, good merchant quality	9 5 0	9 15 0
Staffordshire "Marked Bars"	11 0 0	—
Mild Steel Bars	9 5 0	9 15 0
Hoop Iron, basis price	10 0 0	—
" " Galvanised	17 10 0	—

(*And upwards, according to size and gauge.)

Sheet Iron Black— Ordinary sizes to 20 g.	10 5 0	—
" " 24 g.	11 5 0	—
" " 26 g.	12 15 0	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 10 0	—
Ordinary sizes to 22 g. and 24 g.	16 0 0	—
" " 26 g.	17 0 0	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	18 10 0	—
" " 22 g. and 24 g.	19 0 0	—
" " 26 g.	20 10 0	—
Galvanised Corrugated Sheets— Ordinary sizes, 6ft. to 8ft. 20 g.	15 0 0	—
" " 22 g. and 24 g.	15 5 0	—
" " 26 g.	16 15 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12 10 0	—
Best Soft Steel Sheets, 24 g. & 24 g.	13 10 0	—
" " 20 g.	15 10 0	—
Cut Nails, 3 in. to 6 in.	11 0 0	11 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	£ s. d.	
Lead—Sheet, English, 4lb. and up	20 2 6 ...	—
Pipe in coils	23 12 6 ...	—
Soil pipe	23 12 6 ...	—
Compo pipe	In casks of 10 cwt.	
Zinc—Sheet—		
Vielle Montagne	33 10 0 ...	—
Silesian	33 5 0 ...	—
Zinc, in bundles, 1s. per cwt. extra.		
Copper—		
Strong Sheet ...per lb.	0 1 0 ...	—
Thin " ... "	0 1 1 ...	—
Copper nails ... "	0 0 10 ...	—
Copper wire ... "	0 0 10 ...	—
Brass—		
Strong Sheet ... "	0 0 11 ...	—
Thin ... "	0 1 1 ...	—
Tin—English Ingots ... "	0 0 9 ...	—
Solder—Plumbers' ... "	0 1 0 ...	—
Tinmen's ... "	0 1 2 ...	—
Blowpipe ... "		

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

15 oz. thirds	2½d.	26 oz. fourths	3½d.
" fourths	1⅞d.	32 oz. thirds	5d.
21 oz. thirds	3½d.	" fourths	4½d.
" fourths	2½d.	Fluted Sheet, 15 oz.	3½d.
26 oz. thirds	4d.	" 21 oz.	4½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

⅛ Rolled plate	2½d.	Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	3½d.
¼ Rough rolled and rough cast plate	2½d.		
⅜ Rough rolled and rough cast plate	3d.	Ditto, tinted	5d.

* Not less than two crates.

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 3 4
" " in barrels	"	0 3 5
" " in drums	"	0 3 7
Boiled " in barrels	"	0 3 7
" " in drums	"	0 3 10
Turpentine in barrels	"	0 2 11
" in drums	"	0 3 1
Genuine Ground English White Lead, per ton		27 10 0
Red Lead, Dry	"	24 0 0
Best Linseed Oil Putty	per cwt.	0 10 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6

VARNISHES, &c. (Continued).

	Per gallon. £ s. d.
Fine Elastic Carriage	0 12 0
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 10 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 9
French and Brush Polish	0 10 6

TENDERS.

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, we go to press a day earlier than usual next week, the *Builder* being published on Thursday. All communications must reach the Editor by first post on Wednesday morning, except Tenders, which must reach us *not later than* 6 *p.m. on Tuesday.*

* Denotes *accepted.* † Denotes *provisionally accepted.*

ASHFORD.—For construction of a general dressing-room and a range of six dressing-boxes at the Urban District Council's open-air swimming-bath, Beaver-road. Mr. William Terrill, Surveyor, 5, North-street, Ashford:—

J. J. Pink	£375 0 0	E. J. Bowles	£285 0 0
W. R. Shippam	323 18 0	J. Parkyn, Ashford, Kent*	224 15 10
H. Dixon	317 0 0		
J. Day & Son	310 0 0		

BRADFORD.—For erection of a workhouse at Daisy Hill. Mr. Fred Holland, architect, Bradford:—

C. Booth & Sons, Lidget Green, Bradford‡ £1,945

‡ Accepted subject to approval of the Local Government Board.

BROADSTAIRS.—For alterations and additions at West Cliff Cottage, Broadstairs, for Mr. F. M. Hornsby. Mr. H. Oliver, M.S.A., architect, 4, Whitehall-court, S.W.:—

J. T. May	£212	W. Martin	£190

CARNARVON.—For additions and alterations to the landing-stage, for the Trustees of the Harbour. Mr. W. Bowen Jones, A.M.Inst.C.E., Carnarvon:—

In Timber.

Holme & King	£2,228 0 0
A. Thorne & Sons	1,877 18 6
B. Lumb	1,713 0 0
E. R. Lester	1,700 0 0
H. Jones	1,587 17 0
W. Gradwell & Co.	1,542 14 7

[Engineer's estimate, £1,500.]

In Ferro-Concrete.

A. Thorne & Sons	£1,660 0 0
J. & W. Stewart	1,450 0 0
Yorkshire Hennebique Co.	1,302 0 0
F. Mitchell & Son	1,225 0 0
E. R. Lester	1,050 0 0
British Reinforced Concrete Co.	915 0 0
Liverpool Ferro-Concrete Co., Liverpool*	893 10 0

DONCASTER.—For the erection of new Free Christian Church buildings (first portion), Hall Gate, Doncaster, from plans prepared by Messrs. A. J. Dunn, F.R.I.B.A., & J. B. Mendham, joint architects, Clarendon-chambers, Waterloo-street, Birmingham:—

T. E Elvins & Sons	£3,850	D. Gill & Sons	£3,327
Mullins & Richardson	3,536	C. Sprakes & Sons, Doncaster*	3,030
J. G. Wright	3,518		

KETTERING.—For erection of a corn market hall in Cattle Market, for the Kettering Urban District Council. Mr. Thomas Reader Smith, Engineer and Surveyor, Council Offices, Market-place, Kettering:—

Smith, Edmunds, & Co.	£1,450 0 0	O. P. Drever	£1,337 0 0
T. Hewitt	1,440 13 0	A. M. Bamford	1,335 0 0
Phillips & Slow	1,367 19 9	J. Norris, Kettering*	1,199 11 0
J. G. Pullen & Sons	1,342 15 0	W. Johnson	1,100 0 0

LITTLEHAMPTON.—For erection of cottages, stables, etc., for the Urban Council. Mr. H. Howard, Council Surveyor:—

J. Andrews	£3,300 0 0	Sandell & Sons	£2,750 0 0
Summers Bros.	2,991 12 0	Snewin Bros.	2,669 0 0
R. Cook & Son	2,941 0 0	Wilson & Co.	2,650 0 0
J. Tanner	2,810 16 7	J. Linfield & Sons	2,568 10 0
H. Baker & Son	2,767 10 0		
Burrell & Standen	2,750 0 0		

LITTLEHAMPTON.—For erection of sewerage works and dust destructor, for the Urban Council. Mr. H. Howard, Council Surveyor:—

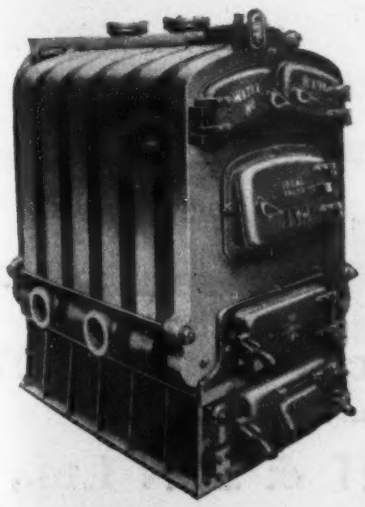
J. Mowlem & Co.	£20,577 0 0	W. Brigg	£17,176 5 0
Bower Bros.	19,755 7 0	J. Ford	16,683 0 0
J. Riley	19,491 3 3	A. Streeter & Co.	16,351 16 11
G. Stow & Co.	18,887 16 3	A. T. Osenton	16,212 3 9
G. Bell & Sons	17,483 0 0	Sangwen & Co.	15,830 0 0
J. Dickson	17,377 14 0	Wilson & Co.	14,580 19 2

LONDON.—For supply, delivery, and erection of penstocks, pipes, and valves to the Crossness pumping-station, for the London County Council:—

Markham & Co., Ltd.	£3,210
Glenfield & Kennedy, Ltd.	3,100
J. Cochrane	2,992
J. Blakeborough & Sons	2,745

Fuel Cost and Heating Efficiency.

The large increase in the price of fuel greatly accentuates the importance of extracting the full calorific value from the coal or coke used for heating purposes—a matter closely affecting the owners and occupiers of all classes of office buildings, factories, shop premises, and private houses.



IDEAL RADIATORS & IDEAL BOILERS

For warming houses, flats, hotels shops, public buildings, etc. by hot water or steam.

The economy of central heating is now generally admitted, but the selection of suitable appliances for the generation and distribution of the heat requires careful consideration if the best results are to be obtained.

The specification by Architects and Engineers of Ideal Boilers and Ideal Radiators for Low Pressure Hot Water and Steam Systems ensures the use of a product which is based on scientific knowledge and more than 30 years' experience—a product made from the best materials, enjoying a world-wide reputation for reliability, efficiency, adaptability, and simplicity of design, construction, and operation.

If you have not our current catalogue we shall be pleased to send a copy gratis and post free.

NATIONAL RADIATOR COMPANY LIMITED. 439 & 441, Oxford Street, London, W.

WORKS: HULL, Yorks.

Agents carrying Stocks: BAXENDALE & CO., Ltd., Miller Street Works, MANCHESTER. WILLIAM MACLEOD & CO., 60, 62, & 64, Robertson Street, GLASGOW.

KEDDAS.—For making up private streets under sect. 150, Public Health Act, 1875, for the Urban District Council of Barton. Mr. S. Slater Grimley, M.Inst.C.E., Engineer and Surveyor:—

	Thurrow-road.	Cobbling-road.	Middleton-road.	Corning-lane-road (part of).	Temple-gardens.	Templeton-avenue (part of).	Wentworth-road (part of).	St. John's-road.	Rowan-croft-avenue (part of).	West Heath-avenue.	West Heath-drive.	Byron-road.	Southern-place.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Elliott & Co.	1,067 0 0	1,228 0 0	1,134 0 0	1,004 0 0	1,004 0 0	1,004 0 0	2,010 0 0	1,004 0 0	1,022 0 0	4,020 0 0	10,750 0 0	0 0 0	0 0 0
W. Griffiths & Co.	1,000 0 0	1,207 0 0	1,207 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0
E. Barrow	1,102 0 0	1,270 0 0	1,211 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0
T. W. Bottomley	1,057 0 0	1,200 0 0	1,097 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0
F. G. Brownrigg	1,040 0 0	1,200 0 0	1,077 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0
R. Bullard	1,047 0 0	1,207 0 0	1,099 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0
T. Adams	1,000 0 0	1,170 0 0	1,000 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0
Morrison & Co.	1,000 0 0	1,000 0 0	1,000 0 0	1,000 0 0	1,000 0 0	1,000 0 0	2,000 0 0	1,000 0 0	1,000 0 0	4,000 0 0	10,000 0 0	0 0 0	0 0 0

LAMBETH.—For rebuilding the Fentiman-road School, Boys and Infants', for the London County Council:—

Leslie & Co., Ltd.	£41,867 0 0
G. A. S. Williams & Son	41,000 0 0
W. Downs	41,000 0 0
C. Wall, Ltd.	39,742 0 0
McLaughlin & Harvey, Ltd.	39,500 10 0
MacCormick & Sons, Ltd.	39,397 0 0
T. D. Long	39,317 0 0
L. R. & R. Roberts	39,000 0 0
P. & T. Thorne	38,750 0 0
G. Godson & Sons	38,550 0 0
Perman & Featherstonhaugh, Ltd.	38,500 0 0
G. E. Wallis & Sons, Ltd.	38,300 0 0
J. & C. Bowyer, Ltd.	38,247 0 0
Bowley Bros.	38,000 0 0
R. Lawrance & Sons, Ltd.	37,947 0 0
Brand, Pettit, & Co.	36,200 0 0

The Architects' estimate, comparable with the tenders, is £39,500.

LAMBETH.—For erection of a fire-station in Brixton Green-road, Kennington, for the London County Council:—

F. G. Minter	£34,250	Perman & Featherstonhaugh, Ltd.	£31,342
Holloway Bros. (London), Ltd.	33,735	Kerridge & Shaw	32,595
Leslie & Co., Ltd.	33,422	W. Downs	32,479
J. & C. Bowyer, Ltd.	32,244	H. L. Holloway	32,000
Higgs & Hill, Ltd.	31,999	W. Johnson & Co., Ltd.	31,679
W. Lawrence & Son	31,732		
R. Lawrance & Sons, Ltd.	31,620		

The Architects' estimate, comparable with the tenders, is £32,500.

LAMBETH.—For alterations and additions, 21, Oxford-square, W. Messrs. Joseph & Smithem, architects and surveyors, 82, Queen-street, Cheapside, E.C.:—

W. Downs	£3,777	C. R. Price	£3,575
J. Simpson & Son	3,695	C. W. Bowis & Co., Ltd.*	3,497

LAMBETH.—For provision of two steam stop-valves, together with necessary pipes, etc., at Wilmington pumping-station, for the Metropolitan Water Board:—

Thames Ironworks, etc., Co., Ltd.	£365 0 0
Stewarts & Lloyds, Ltd.	330 0 0
J. Spencer, Ltd.	145 0 0
J. Hopkinson & Co., Ltd.†	65 10 0

† Quotations for valves only, without pipes.

LAMBETH.—For two houses at Rylett-road, Wormholme Park, for Mr. A. Colombo. Mr. H. Oliver, M.S.A., architect, 4, Whitehall-court:—

Rice & Son	£1,555	Spershley & Smith	£1,397
W. Nash	1,397	Bull & Rothelle, Ltd.	1,362
Bearing Candler, Ltd.	1,365		

MACCLESFIELD.—For additions at the public baths. Mr. Chas. W. Stubbs, Borough Surveyor:—

Roylance & Co., Ltd.	£145	J. Wellings	£135
J. Clayton	127	J. Dakin Steeple-street, Macclesfield*	111
Gorton & Wilson	112		

MORLEY.—For erection of six cottages, for Miss Jones, Gwridog, Rhosgoch, Anglesey. Mr. W. G. Williams, M.S.A., architect and surveyor, Bangor and Benllech:—

Williams Bros.	£1,225	W. Griffiths	£1,030
J. & J. P. Jones	1,071	J. Owen, Moelfre*	958

PUTTENHAM.—For alterations to the Forge Hammer Inn, for Messrs. Allen & Harris, the Brewery, Mortlake Distillery, Mortlake. Mr. C. H. Dorian, M.S.A., architect, Mortlake Distillery, Mortlake:—

G. Williams	£595	A. Lovelock, Ripley, Surrey	
J. Pritchard	590	Mr. Newport, Mon.*	£395
Leadbetter & Co.	549		

PORTSMOUTH.—For erection of a vicarage at Portchester. Mr. Clough Williams-Ellis, architect. Quantities by Messrs. Brill & Monk, North Audley-street, W.:—

C. Griffiths	£1,698	G. Williams	£1,570
J. E. Roberts	1,467	W. G. Evans	1,740
R. E. Symonds	1,360	S. Smith	1,442
Evan Jones & Son	1,300	J. T. Jones, Church Path-lodge	1,429
J. Humphreys	1,710		

* Did not follow instructions.
† Recommended for acceptance.

WOKINGHAM.—For house at Wokingham, for Mr. H. C. Mylne. Mr. Cecil H. Perkins, A.R.I.B.A., architect, Church-road, Bracknell, Berks:—

Chapman	£2,250	Spear & King	£2,080
Brown	2,245	Hughes	2,049
Watson	2,240	Payne & Co., Bracknell*	2,035
Seward	2,234		

WOKINGHAM.—For business premises, 72, Broad-street, Wokingham, for Mr T. S. Fisher. Mr Cecil H. Perkins, A.R.I.B.A., architect, Church-road, Bracknell, Berks:—

Seward	£1,474	Stimson	£1,274
Chapman	1,339	Brown	1,260
Watson	1,328	Payne & Co., Bracknell*	1,137
Martin & Co.	1,297		

Mam Hill Stone.
Doulting Stone.
Portland Stone.

The Mam Hill and Doulting Stone Co., Limited (incorporating the Mam Hill Stone Co. and J. Trask & Son, The Doulting Stone Co.),
Norton, Shepton-Mallet, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Co. (Mr. H. Gilbert), Offices, 42, Pembry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouses floors, fat roofs, cellars, cow-sheds and milk-rooms, granaries, fire-resists, and terraces. Asphalte Contractors to Forth Bridge Co. T.N. 3044 Central.

SPRAGUE & CO., LTD.
PROCESS BLOCK MAKERS
of all descriptions.
69 & 70, DEAN STREET, SOHO, W.

OGILVIE & CO., Telephone: HOLBORN 32. Works' yards, entrance with the last two of W. & J. LAWRENCE & CO., of Bracknell Row.
Amhurst Works, DALSTON LANE, N.E.
EXPERTS IN HIGH-CLASS JOINERY.
ALTERATIONS AND DECORATIONS. ESTIMATES FREE.

J. J. ETRIDGE, Jr. LTD.
SLATE MERCHANTS.
EXPERTS IN
SLATING, TILING.
BEST WORK ONLY.
Telephone 2665 Wall, or write—
BETHNAL GREEN SLATE WORKS,
BETHNAL GREEN, LONDON, E.

ASPHALTE
For Horizontal & Vertical Damp Courses.
For Flat Roofs, Basements, & other Floors.
The best materials and workmanship are supplied by
THE
French Asphalte Co.
Whose name and address should be inserted in all specifications.
For estimates quotations, and all information apply at the Offices of the Company.
5, LAURENCE POUNTNEY HILL, CANNON STREET, E.C.

EWART'S
Cures in 19 cases out of 20.
"EMPEROR"
Write to-day for Illustrated Catalogue Free to
EWART & SON Ltd.,
346-350, Euston Road, London, N.W.
Established 1834.
Telephone: 2570 North.
SMOKE-CURE